

E-commerce companies are using sophisticated load balancing to keep customers happy. Page 60

Surging demand for security staff is fueling certification programs. Here's what one could mean to you. Page 68



Online brokerage Ameritrade revamped its site, focusing on reliability and performance. Page 62

# COMPUTERWORLD

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AUGUST 14, 2000 ■ VOL. 34 ■ NO. 33 ■ \$5 COPS

## UCITA FIX WON'T HELP BIG FIRMS

### 'Mass market' gets relief from remote disabling

BY PATRICK THIBODEAU

The group that drafted UCITA has backed off slightly from one of the more controversial measures in the proposed software-licensing law: a so-called self-help provision that allows vendors to remotely disable the software they sell to users. But that may not be much solace to corporate users.

At its annual meeting, which ended Aug. 4, the National UCITA, page 14

## Problem Areas

Two states, Virginia and Maryland, have adopted the UCITA legislation so far.

**MAIN PROBLEM:** CIOs say the uniform licensing law will give vendors the upper hand by setting a series of adverse default rules in licensing contracts and by forcing companies to attempt to negotiate better terms.

**VENDORS RULE:** UCITA validates shrink-wrap licenses, essentially non-negotiable contracts that vendors use to limit their liability. It also enables vendors to set time limits, allowing for automatic shutoffs.

**RED-ALERT CONCERN:** Security may be put at risk if a vendor has a back door into a company's system. If the license bans reverse-engineering, a customer may not be able to determine whether a vendor has a way into a system.

# UNIONS TAKE AIM AT HIGH-TECH WORKERS

## Verizon strike is a high-profile indication that unions want in to the New Economy

BY MARIA TROMBLY  
AND KATHLEEN OHLSON

Organized labor so far hasn't played a significant role in the New Economy, but unions are fighting to expand their influence into emerging sectors.

The strike by the Communications Workers of America and the International Brotherhood of Electrical Workers

against Verizon Communications is the most recent high-profile indication — following a widely publicized action last year to organize temporary workers at Microsoft Corp. — that such union-related activities may be on the upswing in the high-tech realm.

Union membership has declined in recent years, from

30% penetration in the private sector in the mid-1950s to less than 10% today, according to Gary Chaison, professor of industrial relations at Clark University in Worcester, Mass. Chaison attributed the decline to a failure to confront globalization in business and to an outdated labor model that focuses on strikes and collective

Verizon, page 81

## ONLINE RETAILERS LESS MERRY IN '00

## Firms tighten purse strings, change priorities

BY CAROL SLIWA

Companies working to wrap up their holiday preparations are finding a different online retailing world than the one they found a year ago.

The investment community's chill toward dot-coms has forced many online-only retailers to plot more creative and cost-effective ways to brace for the December rush. Scores of them have been slashing their mass-market advertising budgets, while some struggling companies are also scrambling to partner with or acquire companies that can help them meet their technology and fulfillment needs.

"I think the key is to spend smarter as opposed to spending less," said John Williams, vice president of merchandising and store development at Drugstore.com Inc. The Bellevue, Wash., retailer, which recently raised \$62.7 million via private placement of stock, is adding functionality and gift assortments for the holidays.

Meanwhile, traditional re-  
*E-Retailers*, page 16

# POWER BROKERS



**AMERITRADE CIO JIM DITMORE** says overseas partners are key to navigating global trading. "Each of the foreign exchanges has very complex regulations - and interfaces," he says

**I**N THE QUEST FOR OVERSEAS TRADING DOLLARS, U.S. brokerages are forging alliances at a furious pace. From Argentina to Australia, these partnerships — enabled by IP, XML and other technologies — bring local populations the opportunity to buy U.S.-listed stocks, either online or off-line. Brokerages get access to huge, untapped markets. Yet in our first of an occasional series looking at technology on Wall Street, Maria Trombly finds that not everyone is convinced that this electronic 24/7 world is quite so imminent — or desirable. Some claim that high-profile clients will take their time accepting it, and smaller brokerages are aghast at the disadvantage they face battling international giants with 'round-the-clock service.

Story begins on page 26.

# WALL STREET WATCH

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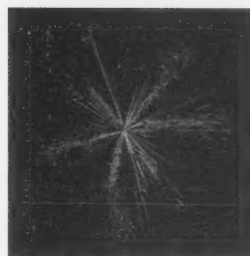
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## WELL-WIRED SUMMER CAMPERS

Summer technology camps for teens aren't new. What is new is the combination of technology and business in the curriculum, such as Bentley College's new "Get Wired, Get Hired" program. We spent a few days with the young women who attended the business school, to learn what this trend means for future IT workers.

Page 44.



## SWARMING AHEAD

An experimental program called Swarm lets social and natural scientists model a changing world. Page 59

# COMPUTERWORLD THIS WEEK

AUGUST 14, 2000

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- 4 ID THEFT CAUSES** the health industry to weigh privacy concerns against the need for access to life-or-death data.
- 6 VERISIGN SERVICE** screens for fraudulent credit-card purchases at the sales counter.
- 8 IBM MAKES** Linux a more integral part of its Unix strategy with its soon-to-be-released AIX 5L.
- 10 REALIGNMENT IS AIMED** at changing Wall Street's view of Computer Associates, say analysts.
- 12 DELEGATES PLAN** to use collaboration software to coordinate activities during the Democratic National Convention.
- 12 DAIMLERCHRYSLER** announces FastCar, a Web-based infrastructure that links design, production and marketing.
- 16 AMAZON.COM TEAMS** with Toysrus.com to launch toy and baby product Web sites.
- 20 ASSOCIATION OFFERS** seal of approval for banks to protect against fraud from fake bank sites.
- 24 SCO CHIEF** Doug Michels talks to *Computerworld* about his company's future.

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- 36 CONSTRUCTION FINDS** savings with an industry-specific application service provider.
- 37 DOUBCLICK STRIKES** a deal with the Clinton administration and other top network advertisers to implement guidelines regarding Web privacy.
- WORKSTYLES**
- 38 ELVIS-PRESLEY.COM** went live with its revamped site for the 23rd anniversary of the King's death. Find out what it was like to work on the project.
- 40 VSPs PUT** a new spin on the application service provider model by providing services for specific vertical industries.
- 41 BUSINESSES GET** office, home and cell phone service, as well as e-mail and faxes, all through one number, thanks to new service providers.
- QUICKSTUDY**
- 47 MANAGEMENT SERVICE** providers sell subscription services to help IT managers monitor Web operations.

## OPINIONS

- 28 MARK HALL** argues that spam may be irritating but it's wrong to censor it without debate.
- 28 DON TENNANT** says Ray Lane's recent departure as president of Oracle ends a clash of egos between Lane and CEO Larry Ellison.
- 29 TIMOTHY C. HOFFMAN,** a therapist, writes of technology's blessings and curses.
- 32 DAVID FOOTE** says he believes the next president must update the nation's labor laws to reflect the Information Age.
- 32 THORNTON MAY** says that of all the networks a CIO deals with, there's none more important than the "human network."
- 36 KEVIN FOGARTY** writes that

## TECHNOLOGY

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- 52 ENTERPRISES ARE** looking for better ways to search, find and mind content in many formats and on various sites.
- SECURITY JOURNAL**
- 56 OUR SECURITY MANAGER** ponders whether a potential attack warrants extreme measures or if the risk is hyped.
- QUICKSTUDY**
- 58 LEARN ABOUT** digital certificates — data files used to establish identities and electronic assets on the Internet.
- 60 E-COMMERCE** companies are turning to sophisticated load balancing, spreading traffic over multiple servers to serve their customers faster.
- 62 AMERITRADE** implements a plan to improve its site's performance.
- EMERGING COMPANIES**
- 66 ORDERFUSION IS** banking on the success of its software suite, which helps e-commerce firms track orders and serve clients.

## This Week Online

■ This week in *Computerworld.com's Windows 2000* section, Gartner Group's **Mike Silver** offers tips to companies that are thinking of migrating to Win 2k.

■ In the *Security Watch* pages, the ACLU's **Barry Steinhardt** takes aim at the FBI, saying the Carnivore e-mail surveillance program "should be caged."

■ Check out *Computerworld's* online **Windows 2000, security** and **e-commerce** forums.

in the wake of problems at online retailers, federal regulations are the only way to help protect consumers.

**38 PETER G. W. KEEN** says IT has it together in terms of where it's going with platform technology.

**82 FRANK HAYES** says anti-spam group MAPS may act like a gang of vigilantes, but for now, companies have to cope.



## AT DEADLINE

### Verizon Strike Hasn't Hurt Firms So Far

The strike by 87,000 Verizon Communications employees hadn't had a demonstrable impact on corporate customers as of late last week. Typical of the comments made by information technology executives contacted by *Computerworld*, Carolyn Sitkiewicz, director of IT communications at Allstate Insurance Co. in Northbrook, Ill., said that while her company hadn't been affected, Allstate has a lot of long-term projects that involve Verizon, so she's watching the situation closely.

Meanwhile, Verizon announced an \$800 million cash deal to merge its Digital Subscriber Line business with San Francisco-based NorthPoint Communications Group Inc. Analysts faulted the timing. "They're pleading poverty and [claim] they can't pay their employees another penny. Then they go out and buy another firm for \$800 million in cash," said Carl Garland, an analyst at Current Analysis Inc. in Reston, Va.

### Win 2k for Data Center

Microsoft Corp. last week announced that it's releasing the data center version of Windows 2000 to manufacturing, a move that sets the stage for a launch of the enterprise-level operating system next month. Microsoft also said Round Rock, Texas-based Dell Computer Corp., Hewlett-Packard Co., IBM and Blue Bell, Pa.-based Unisys Corp. have signed on to sell the Windows 2000 Datacenter Server software on their systems. Those companies join Compaq Computer Corp. as certified resellers of the data center release. Microsoft said it expects to have other vendors on board in time for the scheduled Sept. 26 launch of the software in San Francisco.

## Corrections

■ Our July 31 cover story misidentified the CIO of MGM Studios. His name is Kim Spenichan.

■ In "Oblix: Making It Easier to Manage User Rights" [Page 72, July 24], the price for NetPoint was incorrect. NetPoint is \$50 per user, with volume discounts available.

# Kaiser E-Mail Glitch Leaks Private Info

*Hundreds of patients' personal information sent to wrong addresses*

BY MEGHAN HOLOHAN

**K**AISER Permanent, one of the nation's largest health care providers, has confirmed that a 20-minute computer glitch earlier this month caused e-mail messages containing personal information about hundreds of its members to be sent to the wrong recipients.

On Aug. 2, a batch of 858

e-mail messages containing sensitive information — such as advice about illnesses from an online advice nurse and users' patient identification numbers — was sent to 19 e-mail addresses of other Kaiser members.

According to Kaiser senior vice president and CIO Tim Sullivan, the problem started when the e-mail that was supposed to have been sent in-

advertently got backlogged. Meanwhile, a Kaiser employee had written a script to have e-mail sent to 19 other recipients, and the messages that hadn't been sent the first time were mistakenly sent to those addresses. Twenty minutes later, the Kaiser worker discovered the problem and had the e-mails stopped.

Most of the e-mail included patient identification numbers that provide access to Kaiser's online services and information on appointments, said a spokeswoman for the Oakland, Calif., health care organization.

Many of the 19 e-mail addresses were so overloaded by the huge files that their owners couldn't open those messages. Most of the members who did open the messages didn't read them after realizing the information didn't pertain to them, Marshall said. She said most of the 19 recipients contacted Kaiser when they received the numerous messages.

### Informing the Users

Most of the 858 users affected by the glitch have been reached by phone and informed of the error, according to the spokeswoman.

She added that Kaiser has offered to change the patient identification numbers of any members who fear that their confidentiality was compromised, but most people haven't asked to have their numbers changed. ■

# Health Care Industry Looks at Security Risks

*Data theft at cancer institute highlights concerns*

BY JULEKHA DASH

Health care officials said alleged data theft last week at a leading cancer center in Boston highlights the security issues the industry faces.

But experts also said information technology leaders face the daunting task of balancing the need for patient privacy in an industry where the flow of information can literally affect the lives of their customers. Moreover, security at health care organizations will come under increased scrutiny in coming months as federal agencies review regulations that require health organizations to protect the security and privacy of electronic information.

Officials at the Boston-based Dana-Farber Cancer Institute alleged last week that temporary worker Marlene Honore stole personal data, including the Social Security numbers and addresses of at least 23 patients. In her work as a data entry clerk, Honore had access to computer files, though the information was administra-

tive, not medical, according to Dana-Farber spokesman Steve Singer.

The investigation prompted officials at Dana-Farber to perform criminal background checks of temporary workers and review data access policies, although they haven't decided how their information security procedures will change, said Singer.

### No Background Check

Alan Paller, director of research at the SANS Institute in Bethesda, Md., said that while organizations across all industries rely increasingly on temporary workers, they don't often perform background checks on them.

"Pedophiles often get a job in an elementary school. If you're a data thief, the easiest thing is to get a job as a temp. It's a lot easier than breaking in from the outside," said Paller.

But preventing situations like the one at Dana-Farber is difficult because many people in a health care organization have legitimate access to information, according to Mitchell Morris, senior vice president and CIO at the University of Texas M.D. Anderson Cancer Center, one of the nation's top cancer facilities.

In addition to temporary

workers, health care providers rely on volunteers, some of whom also have access to patient data.

The case at Dana-Farber comes at a time when health care organizations "are putting more money in beefing up their information systems" to address security issues, said William Gillespie, CIO at WellSpan Health, a not-for-profit integrated delivery network in York, Pa. That's because the in-



MITCHELL MORRIS, CIO of the M. D. Anderson Cancer Center, says IT leaders must balance privacy and health care

dustry is awaiting federal legislation that would demand that health officials pay fines or even possibly face jail time if they don't adequately safeguard patient information.

The challenge for IT leaders preparing for the legislation is to strike a balance between safeguarding privacy and ensuring that security measures

are flexible enough so that caregivers aren't denied access to information in a life or death situation, said Morris.

M. D. Anderson uses home-grown software to store the most sensitive of patient data.

This enables the organization to add various levels of security so that employees can access only the information that they need to know. Morris said leading health care vendors' applications aren't yet sophisticated enough to provide such flexibility, though some can provide an audit trail of users who have accessed sensitive information.

### A Closer Look

Under the Health Insurance Portability and Accountability Act (HIPAA) — passed by Congress in 1996 but not to be fully implemented until the U.S. Department of Health and Human Services outlines rules for its enforcement over the next few months — IT's role in protecting patient privacy will involve paying closer attention to addressing procedural issues, rather than technology, said health care experts.

According to Frank MacDonald, a senior manager at First Consulting Group in Long Beach, Calif., HIPAA regulations will likely require that hospitals have a chief security officer, as well as a disciplinary policy to address privacy breaches. ■



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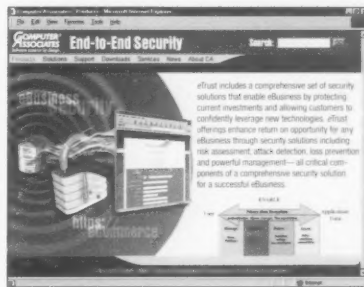
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\*According to "Internet Security Software: 1999 Worldwide Markets & Trends," by IDC.

# Netscape Flaw Leaves Files, Directories Open to Hackers

*But filtering software, firewalls offer some protection, analysts say*

BY JAIKUMAR VIJAYAN

A RECENTLY discovered flaw in Netscape Communications Corp.'s Internet browser software could let malicious hackers retrieve and view any directory or locally stored file on a victim's computer.

But corporations using basic security measures such as filtering software and properly configured firewalls should have at least some measure of protection against the flaw, security analysts said.

The problem results when a certain function of Sun Microsystems Inc.'s Java core is combined with a vulnerability in Netscape's implementation of Java that allows applets to access local files, said David Endler, an analyst at iDefense Intelligence Services, an Internet security services firm in Fairfax, Va.

An attacker could exploit the hole by creating a malicious Web site that invisibly loads a Java applet on a visiting user's computer, according to an alert from iDefense.

The applet starts a Web server on the user's system that allows anyone to connect to it and view locally stored files and directories, the advisory added.

"In theory, you can make

public entire directories of a victim's computer," Endler said. "It's sort of like a poor man's Napster."

An exploit taking advantage of the flaw was posted Aug. 4 by Daniel Brumleve, a programmer in Silicon Valley who discovered the flaw.

In examples posted on his Web site, Brumleve demonstrated how the vulnerability

— nicknamed Brown Orifice — could be exploited to allow others to view and retrieve files without any warning.

In worst-case scenarios, attackers could use this method to steal passwords, user names and the entire contents of files, said Chris Roulund, director of the X-Force team of security analysts at Internet Security Systems Inc. in Atlanta.

The Brown Orifice exploit — the code for which can be downloaded from Brumleve's Web site ([www.brumleve.com/BrownOrifice/](http://www.brumleve.com/BrownOrifice/)) — was a "proof-of-concept" code designed to show how "Netscape's Java engine violates Java's 'sandbox' rules," which prevent applets from touching the host system's operating system, Roulund said.

But users will first need to voluntarily visit malicious Web sites or click on e-mailed links to a malicious site to be ex-

## Quick Fix

Users can protect themselves from the vulnerability by disabling Java. Here's how:

- 1) Go to Edit menu on the browser
- 2) Click on Preferences
- 3) Choose Advanced option
- 4) Click on Enable Java option to remove check mark against the option

posed to the vulnerability, said Andrew Weinstein, a spokesman for America Online Inc., which owns Netscape.

Weinstein said Netscape is working on a patch that will fix the hole. ■

## Microsoft's Stinger Adds to Wireless Buzz

*New smart phone part of company's handheld strategy*

BY MARK HALL

Microsoft Corp. lifted the curtain a bit last week on new software for smart phones that together with the company's wireless server platform could prove popular with information technology managers looking for application integration. But the company's approach won't solve IT's biggest roadblock to wireless application deployment: limited bandwidth.

Integration will be critical if Microsoft is to lift itself from its underdog status in the wireless arena, according to

### JUST THE FACTS

## Stinger's Fine Points

Microsoft's approach to smart phones:

- Stinger includes the Windows CE operating environment, adapted for smaller devices and screens.
- It provides full access to the Web.
- Carriers selling Stinger-based devices can brand the user interface, encouraging broader distribution in a market where Microsoft is an "underdog."

Elliott Hamilton, an analyst at Washington-based Strategis Group Inc.

Most analysts put the company's market share at around 10% for wireless handhelds.

Last week, Microsoft demonstrated a prototype smart phone from a development project called Stinger. It has a larger-than-normal cell-phone color screen for displaying text and images, a Web browser and applications, such as a mobile version of Microsoft Outlook that will enable users to synchronize data between mobile devices and servers. That synchronization will occur via AirStream, the company's code name for its middleware that translates server-based applications into a format viewable by wireless devices.

Samsung Electronics Co. in Seoul, South Korea, will introduce a line of Stinger-based smart phones in North America next year.

Vince Borrego, an IT manager at San Carlos, Calif.-based Epocrates Inc., a health care start-up, said he's frustrated that his wireless Palm Inc. handhelds and Nextel Communications Inc. cell phones can't synchronize Outlook data with his Microsoft Exchange back end. If Stinger devices and AirStream solve this problem, he said, "it would be very wonderful."

Jeff Misenti, director of Internet application development at Suretrade Inc., a financial services company that provides wireless access for its customers, said his Lincoln, R.I.-based firm would embrace Microsoft's approach because his users access data from all kinds of wireless devices.

Consumers will still use a variety of client devices, but corporate users might adopt Microsoft-branded clients as a standard, said Sergey Fradkov, chief technology officer at W-Trade Technologies Inc. in New York.

Hamilton agreed. "[Microsoft's] an underdog in the wireless field now," he said. "But if they leverage integration with the desktop, it'll help them with large companies."

Fradkov said Microsoft has been designing devices that require more memory, use color screens and include features such as MP3 playback, all of which add to the cost of a handheld device. ■

James Niccolai and Ashlee Vance of the IDG News Service contributed to this report.

## VeriSign Launches Flat-Fee Fraud-Screening Service

BY ANN HARRISON

Online merchants are liable for hundreds of millions of dollars worth of fraudulent purchases each year, but few flat-fee payment services screen for credit-card fraud at the point of purchase.

Mountain View, Calif.-based VeriSign Inc. this month launched a new flat-rate fraud-screening service that detects

bogus charges in real time while processing payments.

"The innovative thing is pricing," said Joseph Marino, an analyst at Current Analysis Inc. in Sterling, Va. "Payment fees are commoditized, and payment companies realize they can't be viable unless they offer fraud screening. This puts downward pressure on payment costs."

VeriSign's Payflow Fraud

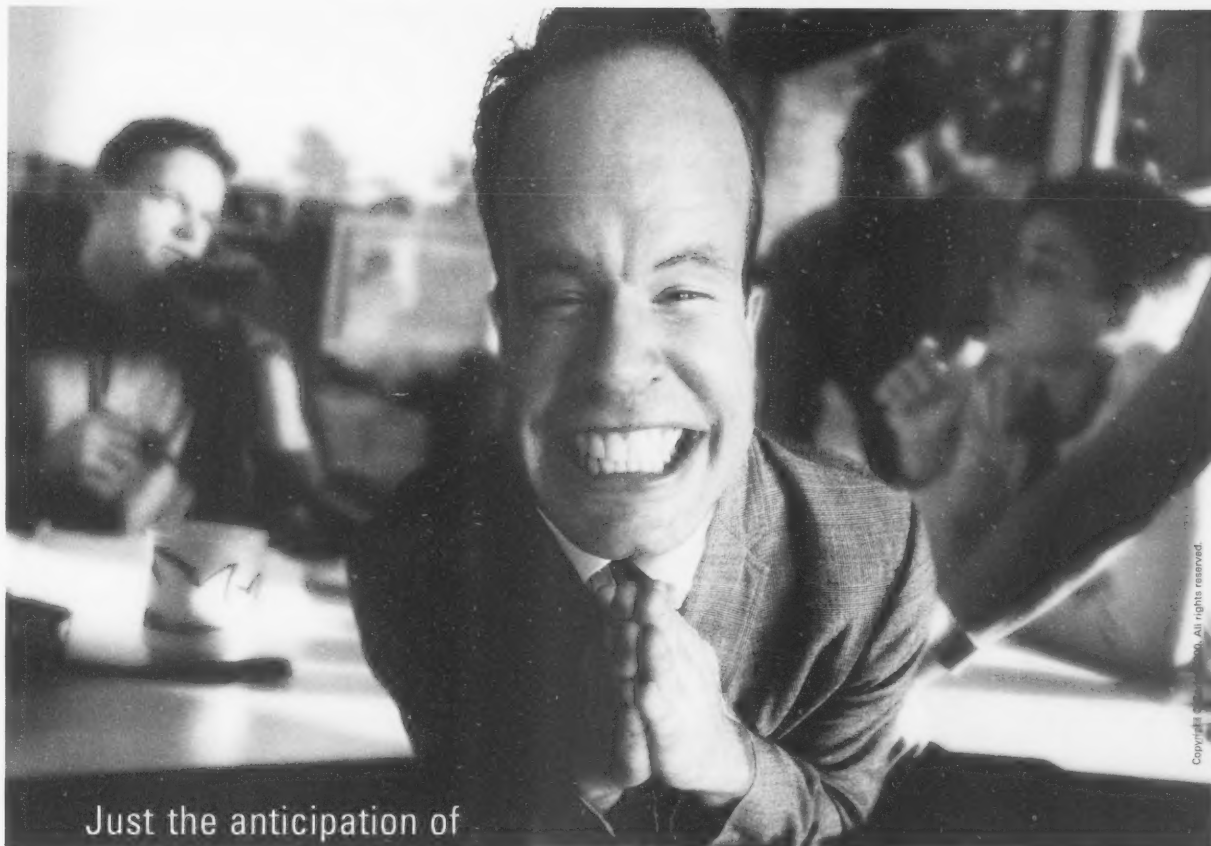
Screen service is based on the eFalcon fraud-scoring technology developed by HNC Software Inc. in San Diego. The eFalcon technology has been used for 10 years to protect credit-card holders when making off-line purchases. Payflow has been integrated with VeriSign's Payment Services, permitting merchants to complete authorization and fraud evaluation on Internet credit-card purchases with one request.

Merchants using VeriSign's Payflow Pro payment service are charged a monthly fee of \$59.95 for as many as 5,000 transactions per month. The

Payflow Fraud Screen costs \$39.95 per month at the same transaction rate. The combined package sells for \$100 per month. Additional transactions are 15 cents each.

Marino noted that a number of companies, including CyberCash Inc. in Reston, Va., and Equifax Inc. in Atlanta, have recently partnered with HNC for use of the eFalcon technology. But the Payflow pricing should give competitors pause, he said.

"Anyone else who has partnered with HNC should be up in arms and should go and renegotiate their contracts," Marino said. ■



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## BRIEFS

## Microsoft Names Head of .Net Group

Microsoft Corp. launched its .Net division last week and announced that Bob Muglia will head the .Net services unit as group vice president. Muglia will focus on the development of software, subscription services and interface design for the .Net division, Microsoft said in a statement. The .Net services division will be part of the new personal services and devices group headed by Rick Belluzzo, Microsoft said.

## Bluefly May Sell

New York-based online retailer Bluefly Inc. last week posted substantial revenue increases but announced that it is low on cash and might look for buyers. Bluefly, which bills itself as "the outlet store in your home," posted a loss of \$5.3 million for the second quarter. The company has engaged New York-based Credit Suisse First Boston Corp. as a financial adviser and has formed an internal committee to evaluate three options for its future: raising more money, fashioning new partnerships or selling out.

## Convenient Connection

Leveraging the technical muscle of corporate parent Oracle Corp., e-Travel Inc. has released a slate of Web-enabled services that add travel management capabilities to purchasing, human resources and other back-office functions. While e-Travel doesn't have the market share of competitors such as Sabre BTS or GetThere Inc., its latest services are taking business-to-business travel technology to a new level, said Kate Rice, an analyst at Sherman, Conn.-based online travel research firm PhoCusWright Inc.

## You Can Be a Registrar

The Internet Corporation for Assigned Names and Numbers (ICANN) will start accepting applications for companies that want to become domain-name registries on Sept. 5. The registries will manage the new top-level domains that are under consideration, such as .biz, .firm, .ecom and .union. ICANN is charging a \$50,000 application fee.

## IBM OS Targets Intel Market, Linux Users

AIX gets performance boost, Linux support

BY JAIKUMAR VIJAYAN

IBM IS MAKING integration with Linux a top priority in its evolving strategy to push AIX Unix into the Intel Corp. market, the company said.

IBM this fall will release AIX 5L, a freshly minted and re-named version of the AIX operating system, combining extensive Linux support with performance-boosting features (see chart at right) designed to appeal to IBM's high-end customer base.

The operating system will be the first AIX version capable of running on both IBM Power-based systems and on Intel's upcoming IA-64 ar-

chitecture, according to IBM.

This will give existing Power-based AIX users another hardware platform on which to run their applications. It will also give Linux users a way to combine their applications with the high-end scalability and availability of AIX, said Dave Turek, a vice president at IBM.

Linux support on AIX 5L will include source-code compatibility and a Linux "build-time" environment, with tools and utilities that provide a Linux "look and feel" development environment on AIX, IBM said.

Linux application programming interfaces will be rehosted and opti-

mized for AIX, while standard AIX libraries will be enhanced to support Linux. Linux applications on IA-64-based systems will be able to run on IA-64-based AIX 5L systems with a simple recompilation of the source code, according to IBM.

## AIX/Linux Link

This integration will make it easier for users to link AIX and Linux applications, said Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston.

"What they are trying to do is make the case that applications can flow freely between AIX and Linux," at least on IA-64 platforms, Claybrook said.

In addition, major system vendors such as Unisys Corp. in Blue Bell, Pa., and Bull HN Information Systems Inc. in Brighton, Mass., will ship systems running AIX 5L on IA-64 architecture when it becomes available, Turek said.

IBM's moves are as much a testimony to its efforts to move AIX to mass-volume Intel platforms as they are to the grow-

ing popularity of Linux, said Brad Day an analyst at Giga Information Group Inc. in Cambridge, Mass.

During the past two years, IBM has been working with The Santa Cruz Operation Inc. in Santa Cruz, Calif., and Sequent Computer Systems Inc. — now owned by IBM — to develop an AIX version for Intel.

"AIX 5L is the end result of that effort," Day said.

"What we are seeing here is the realization that Linux is really beginning to take root in a very lucrative manner," said Joyce Becknell, an Aberdeen analyst. "It's about IBM trying to extend AIX market share."

"Anything that enhances AIX share can only be a good thing" for users, said Bob Venable, manager of enterprise systems at Blue Cross/Blue Shield of Tennessee.

As a longtime user of AIX, Venable he says he's more interested in some of the new high-end functionality in AIX 5L — such as its support for more processors and its ability to partition workloads — than he is in the new Linux support.

"AIX has excellent reliability and performance. ... Those are the features we are most interested in" for the moment, Venable said. ■

## JUST THE FACTS

## Unix Gets A Lift

Key high-end enhancements in AIX 5L:

- 64-bit kernel
- Enhanced TCP/IP
- Multipath routing for higher bandwidth or high availability
- Enhanced workload management software that allows administrators to give priority to Web-serving applications and resources

## LinuxWorld: Hardware Vendors Make Their Move

Big open-source push expected

BY DOMINIQUE DECKMYN

Linux will receive another major boost this week as several key hardware vendors step up their support for the open-source operating system at LinuxWorld in San Jose.

Hardware vendors will dominate the show, with Dell Computer Corp.'s Michael Dell delivering the opening keynote address and IBM, Hewlett-Packard Co. and Sunnyvale, Calif.-based VA Linux Systems Inc. all expected to make major announcements.

While IBM and, to a lesser extent, Dell have increasingly been profiling themselves as Linux players over the past two

years, HP's support has been more low-key. That's expected to change this week, as company makes a major commitment to supporting the operating system across virtually all its product lines.

HP will ship a developer release of Linux for its HP 9000 servers and demonstrate some key software tools from its proprietary HP-UX environment running on Linux.

## Software Vendors' Strategies

In what many say may be one of LinuxWorld's most significant news items, VA Linux is expected to announce today a new service to preinstall applications on Linux systems.

While IBM, HP and VA Linux can use Linux to boost hardware sales, vendors without hardware businesses are ex-

perimenting with other business models in order to cash in on the success of open-source software.

"Many people have downloaded our software [for free], and we'll never even hear from them," said Jim Capp, president and CEO of Harrisburg, Pa.-based Antell Inc., which is demonstrating its open-source customer relationship management software at the show. Like San Mateo, Calif.-based OpenSales Inc., which is showcasing its open-source e-commerce server, Antell plans to give away software to boost its user base and then make money selling customization and systems integration services.

The show may see the re-emergence of the open-source operating system as a credible contender for the desktop. Palo Alto, Calif.-based Eazel Inc. will demonstrate its new desktop environment and online system update service for Linux.

In addition, Sun Microsystems Inc. will showcase Star-

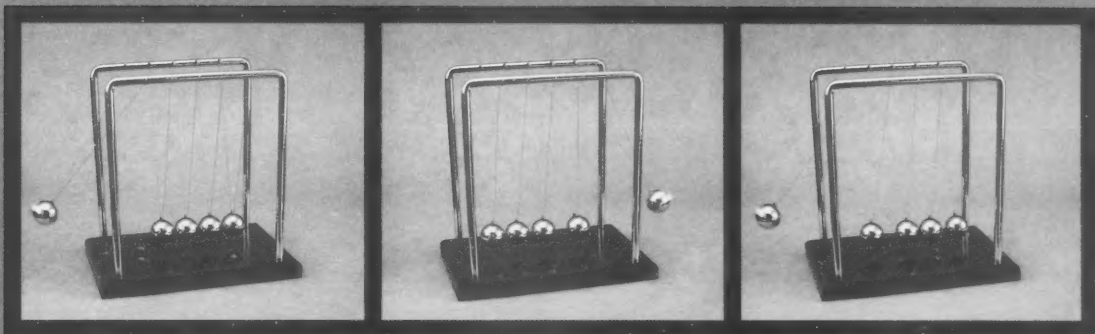
Office, its productivity suite for Linux, Windows and Unix.

"The combination of Eazel, StarOffice and some other tools would make laptops running Linux really attractive," said Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston. ■

## AT A GLANCE

## LinuxWorld Highlights

- VA Linux: Configurable software pre-install for Linux systems
- IBM: Linux running on hardware ranging from a wristwatch to an S/390 mainframe
- HP: Major commitment to Linux on commercial Intel-based systems; developer edition of Linux for PA/RISC
- Inprise Corp./Borland: Kylix, the Linux port of its Delphi and C++ development tools
- Chillware: Four Linux applications, including a contact manager and desktop publishing tool and its own Linux distribution
- Caldera Systems Inc.: Introduction of Cosmos system management tool; beta due in the fall.



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## CA Aims to Impress Investors With Shake-up

BY JAIKUMAR VIJAYAN

The corporate realignment at Computer Associates International Inc. was aimed more at

stoking Wall Street's tepid interest in the firm than at initiating sweeping changes on the customer front, analysts said.

In a widely expected move, CA last week announced that founder Charles Wang was stepping down as CEO. Presi-

dent and Chief Operating Officer Sanjay Kumar was named to the post. Wang will continue as chairman of the company.

Islandia, N.Y.-based CA also announced plans to spin off some of its software and ser-

vices business into independent companies.

The first unit being spun off will be called iCan-ASP Inc. It will be aimed at providing software technologies for application service providers. CA also announced plans to sell some of its desktop technologies but gave no deadlines.

The moves came a few weeks after CA announced a 69% plunge in profits for its latest quarter and were seen by analysts as an attempt to bolster Wall Street's confidence in the firm.

"This reorganization is at least in part being driven by a feeling that CA's stock price does not reflect the true value of the company," said Michael Dortch, an analyst at Robert Frances Group in Westport, Conn.

Spinning off some of its businesses into independent units will give the company a new way of "extracting that value," Dortch said.

"I think they want people in the investment community to know they have a plan in place to increase shareholder value," said Paul Rodriguez, managing director at New York-based C. E. Unterberg, Towbin.

"But I was hoping they would get a little more aggressive" in terms of spinning off more business units, Rodriguez added.

Kumar is taking the helm as \$6 billion CA attempts to shrug off the consequences of delayed mainframe software contracts and weak sales in Europe. Those resulted in first-quarter profits dropping to \$84 million from \$272 million a year ago.

Despite the fall in profits, analysts said they don't believe that CA is in any financial trouble yet. Instead, the company's real challenge will be to shake its image as a vendor of just mainframe technologies, Dortch said.

CA sells a wide range of software, including security and customer relationship management technologies, but it's still mostly known for its enterprise products.

"They could definitely leverage their product lines better," Rodriguez said. "But I think they are working on it." ■



**SANJAY KUMAR** is the new CEO at CA



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## BRIEFS

Former PepsiCo CIO  
Resurfaces at Feld

Former PepsiCo Inc. CIO Steve Schuckenkrock has joined The Feld Group as managing partner of client services. In his new position, Schuckenkrock, who left PepsiCo last month, will oversee all of the Dallas-based technology management firm's revenue-generating operations. Among other things, Feld Group places temporary CIOs and technology teams at companies ranging from electronic-business start-ups to Fortune 1,000 firms.

AOL Shuts Down  
MP3 Search Engine

America Online Inc. last week shut down the MP3 file search engine on its Nulsoft Winamp music player site, which enabled its users to search the Internet for music. "The search came down because we saw that we don't have an efficient way to distinguish between legal and illegal MP3s," said Jay Whitney, an AOL spokesman. He denied, however, that the move resulted from pressure from New York-based Time Warner Inc. AOL is planning a merger with Time Warner, which has a music unit and is suing several MP3 file-sharing companies, including the controversial Napster Inc. search program that's under legal assault by the music industry for similarly failing to distinguish between legal and pirated music.

## Short Takes

DELL COMPUTER CORP. in Round Rock, Texas, reported \$603 million in profits for the second quarter, ended last month, compared with \$507 million for the same period a year ago. Sales totaled \$7.67 billion for the second quarter, up from \$6.1 billion last year. . . . ADOBE SYSTEMS INC. in San Jose filed suit against MACROMEDIA INC. in San Francisco for patent infringement. Adobe has alleged that Macromedia infringed on its tabbed-palette patent. . . . SUN MICROSYSTEMS INC. will have to wait a little longer to find out when its Java lawsuit against MICROSOFT CORP. will go to trial after a case management conference that was due to take place last week was postponed until Oct. 18.

DaimlerChrysler Drives  
FastCar Web Initiative

## Massive IT effort aimed at trimming costs

BY LEE COPELAND

**D**AIMLERCHRYSLER AG last week detailed a new Web-based initiative that will augment existing systems and link all aspects of its vehicle design, production and marketing operations.

Officials at the Stuttgart, Germany-based automaker hope the infusion of new product development technology will speed vehicle development and trim costs in the face of slumping profits.

The FastCar project will include the deployment of a Web infrastructure that will provide tighter communication among design, engineering, manufacturing, quality, finance, procurement, and sales and marketing units in the Chrysler division, said Gary Dilts, senior vice president of e-connect

platforms at DaimlerChrysler.

"In the old system that worked sequentially, it took months before suppliers knew what was being done," said Dilts. "Now, they won't be cutting tools based on Assumption A, when we're working on Assumption C."

For example, approved prod-

uct design changes will be communicated instantly to other departments within DaimlerChrysler as well as to external suppliers that are involved in equipping a new car.

Dilts said communicating changes instantaneously over the Web could cut vehicle production costs by as much as 20% and trim production cycles by three months. He wouldn't disclose the cost of the new system.

Analysts said such improvements in change-management processes could help DaimlerChrysler cut costs — a step the company has been looking for as profits have slowed in its Chrysler unit.

"The real pain point is helping project managers in [different operational units] plan for ordering products and finding optimal parts," said Navi Radjou, an analyst at Forrester Research Inc. in Cambridge, Mass. "That part costs lots of money because there is little

collaboration across units during the design phase."

Initial pieces of the system could be deployed as early as October. The automaker plans to start with the North American units responsible for its large passenger vehicles.

DaimlerChrysler will use Computer Aided Three-Dimensional Interactive Application (CATIA) software developed by Dassault Systemes SA in Paris and business integration software from i2 Technologies Inc. in Dallas in the FastCar project. The new infrastructure will augment existing CATIA systems, the firm said, and let 4,100 internal employees and 5,000 external users communicate and access design changes over the Web.

Jim Hossack, an analyst at Tustin, Calif.-based AutoPacific Inc. in said adding concurrent communication to the CATIA systems should further shorten development times and costs. ▀

## FastCar

DaimlerChrysler hopes a massive technology infusion will cut production costs by 20%. The plan includes:

- Computer-aided design software by Dassault Systemes and business integration software from i2 Technologies
- Access to the FastCar Web-based system for more than 4,100 internal employees and 5,000 external users
- An initial rollout set for October and for all North American units by 2003

Democratic Convention  
Links Up With IntranetASP offers meeting  
software for free

BY MARK HALL

With most of the floor activities likely to be scripted in advance, the best action at this week's Democratic National Convention may just be online.

Some of the delegates to the political gathering, which begins today in Los Angeles, are using communication and collaboration software developed and hosted by an application service provider to plan convention events. All of the 5,000 delegates will be able to use the software remotely or at kiosks in the convention hall to keep in touch with fellow Democrats inside and outside the Staples Center, where the con-

vention will take place.

Dan Slater, a delegate who is an attorney at McDermott Law Firm in Cañon City, Colo., said he doesn't expect much spirited debate on the convention floor. But he intends to use the temporary intranet to follow how the convention is being perceived in his home state. "We're in a bubble in the Staples Center," he said.

The application, developed by Event411.com Inc. in Marina Del Rey, Calif., has been in limited use by several hundred people for the past two weeks, although passwords have been given to all of the delegates and to a wider group of Democrats.

Event411.com is letting the Democrats use the

software for free. The company said it made the same offer to the Republican Party for its convention but never heard back from the GOP's organizing committee.

Event411.com customizes its meeting software for each event and spent about one month preparing the collaboration service for the Democrats. Four levels of access were set up — two that permit the development and planning of events at the convention and provide full communications capabilities to the desig-

nated users; another that lets convention delegates schedule events on their personal calendars and send and receive e-mail; and a fourth that lets friends and family communicate with the delegates.

Delegate Doug Stone, an attorney at Kansas City, Mo., law firm King Hershey Coleman Coch and Stone and chairman of the Democratic Party organization in his county, said he has already used the collaboration technology to generate ideas for party activities. For example, he created working groups for planning fund raising and social events with other county-level party officials.

They also exchanged messages that critiqued one another's Web sites and provided suggestions for improvements, Stone said. He added that he sees the collaboration service as a vehicle for helping local politicians "grow the party at the grassroots level." ▀



THE DEMOCRATIC CONVENTION'S intranet will provide delegates a means of group collaboration

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# Online Retailers Hit By Pricing Glitches

*Industry observers say companies ill-prepared to handle such errors*

BY LINDA ROSENCRANCE

**P**RICING GLITCHES at Staples.com and Amazon.com Inc. within the past two weeks left some customers happy but others miffed, as the firms scrambled to recover from discounts unintentionally given to some customers.

Although the problems at Seattle-based Amazon and Framingham, Mass.-based Staples.com were different in nature, they call into question the ability of online retailers to effectively control the content of their Web sites.

Last week, a glitch in Ama-

zon's computer system lowered prices by 50% or more on some items. The cause is still unclear. In one e-mail to customers, Amazon blamed computer error. But in another e-mail, it said the pricing problem occurred because suppliers raised their prices. In one case, the price of a refrigerator play set was listed as \$2.49, but Amazon later said the correct price was \$24.99.

An Amazon spokeswoman said the company is too busy to respond to questions about the pricing glitch, though it told some news outlets that the errors were due to a "hiccup" in the system.

In Staples.com's case, discount coupons intended only for certain customers were obtained by someone randomly punching numbers into the coupon tab field at its Web site. That person then posted the coupons on FatWallet.com, a site that alerts consumers to discounts at various online stores and provides a forum for consumers to share information, according to Tim Storm, founder of Monroe, Wis.-based FatWallet.

David Cooperstein, an analyst at Forrester Research Inc. in Cambridge, Mass., said the pricing errors point to a more widespread problem.

"These [highlight] the problem of content-management and pricing-management systems," he said. "Companies have to have better workflow

management to make sure that the prices that are posted are the right prices before a shopper [sees them] and [that] coupons can't be introduced" where they shouldn't be.

Staples spokesman Tom Nutile said that although coupon glitches are rare, they do happen to online, catalog and brick-and-mortar retailers. In the online world, coupons are strings of numbers that a consumer types into an area on a merchant's Web site. Some can be used multiple times, while others can be used only once.

FatWallet's Storm said one way online merchants can prevent coupon glitches is to tie the coupon to one person's account so that only the intended recipient can use it. He also said companies should have a monitoring system in place to alert them to items that are being sold below cost.

Eric Lazarus, president of Lazarus Technology Mentoring Inc. in New York, a firm that helps online companies deal with incorrect pricing and coupon problems, said pricing

## Pricing Patrol

*Online merchants can guard against pricing glitches by:*

- Managing the content of their Web sites more effectively
- Having a team of inspectors review pricing code
- Installing a monitoring system to alert them to items that are being sold below cost
- Employing one-time-use rather than multiple-use coupons
- Tying coupons into a customer's account to prevent unauthorized use

glitches are often caused by coding errors.

"The best guard against this is to have a code inspection," he said. "After the programmer thinks he has written the code right, a team of technicians should [review] the code, circle anything that looks suspicious and send it back to the developers."

Continued from page 1

## UCITA

Conference of Commissioners on Uniform State Laws agreed to end the self-help provision for mass-market software sold via retail channels. However, the provision remains in effect for other types of software, such as customizable applications purchased by companies.

Software vendors could take advantage of the self-help capabilities allowed by the Uniform Computer Information Transaction Act (UCITA) to cut off users who they claim haven't paid their license fees or who allegedly have violated their contracts in other ways, such as by having more end users than their licenses allow. That's one of the reasons opponents have claimed that the draft law gives too much power to vendors at the expense of their customers.

Carlyle Ring, a former general counsel at Atlantic Research Corp. in Gainesville, Fla., who heads the UCITA drafting committee, said the prohibition of self-help actions by vendors of mass-market software was originally includ-

ed in a version of the licensing law approved by the state of Maryland in April.

Officials attending the conference "thought that it was a change that alleviated some measure of concern" for users, Ring said.

UCITA, which was sent to the legislatures of all U.S. states and territories for their consideration in July of last year, seeks to bring a set of consistent rules to software contracts and licensing agreements. But it has been plagued by controversy almost since the Chicago-based conference of commissioners, with representatives from all 50 states, first began drafting the law back in 1996.

Maryland and Virginia are the only two states that have adopted UCITA thus far.

### Security Concerns

The law has drawn considerable opposition from corporate CIOs, who are particularly worried that the self-help provision will pose security risks to their systems and give software vendors the upper hand in licensing negotiations.

Cem Kaner, an attorney and computer science professor at the Florida Institute of Tech-

**[Under UCITA, vendors can] create a hole in your security at no risk to themselves.**

**CEM KANER, ATTORNEY AND PROFESSOR, FLORIDA INSTITUTE OF TECHNOLOGY**

nology in Melbourne, said the change made to UCITA at the recent meeting is "insignificant" for corporate users.

Although consumers would be exempt from the self-help provision, a company that buys a large quantity of off-the-shelf software wouldn't likely fall under the definition of mass-market customer, he said. In addition, any applications purchased via a site license wouldn't be clear of the provision, nor would virus updates or software products bought through a subscription

service, according to Kaner.

But the biggest drawback for companies isn't that their software could be turned off, Kaner said. Rather, it's the potential for vendors to open up security holes in corporate systems through self-help mechanisms. "UCITA imposes no liability on the vendors," he said. "They create a hole in your security at no risk to themselves."

Bill Zumwalt, CIO at Temple, Texas-based McLane Co., a major wholesale distributor, called the change "a very clever move on the part of the [UCITA] proponents, because it enables them to say, 'Mr. and Mrs. John Doe, you won't be impacted by this.'"

The restriction against mass-market self-help "does not offer any value" to businesses, he added. Zumwalt said the thing that most concerns him about UCITA is its ability to offer "a human element of control" over a company's business systems. "That is a high-risk situation," he added.

Ring argued that the self-help provision can't be included in software contracts by vendors unless end users give their specific consent. Ring said he negotiated many tech-

nology contracts at his former job and frequently had vendors change contracts to include terms that were more acceptable to Atlantic Research.

But, Zumwalt said, even if a company negotiates a contract with a vendor that prohibits self-help or automatic turn-offs, the capability is still being built into a system. "It's another level of risk that we didn't have to worry about yesterday," he said.

And the self-help provision is only one of a number of items in UCITA that have been criticized by end users and other opponents.

The amendments made earlier this month by the conference of commissioners "do not address the broader concerns raised by UCITA," said Jonathan Band, a partner at Morrison & Forester LLP in Washington, who is representing the American Library Association and some software developers who also oppose the draft law.

Addressing the broader concerns, Ring acknowledged that further changes to UCITA are possible.

"We continue to look at areas of concern," Ring said. "If we were perfect, we'd get it correct the first time, wouldn't we?"



## AT 178 MPPS, WHO CARES ABOUT AERODYNAMICS?

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# iParty.com to Buy Stores

Party goods e-retailer adds physical presence

BY JENNIFER DISABATINO

**I**N A MOVE AIMED at giving itself a brick-and-mortar presence, online party goods retailer iParty Corp. last week announced a deal to buy 33 stores in the eastern U.S. from The Big Party Corp., a West Roxbury, Mass.-based retail chain that filed for bankruptcy protection earlier this year.

Under the agreement, New York-based iParty will acquire

the leases on retail stores in Massachusetts, Connecticut, New Hampshire, Rhode Island, Florida and Maine, along with those stores' product inventories and fixed assets. The two companies didn't disclose the financial terms of the deal, which is expected to be completed later this month.

Officials at iParty — which launched its Web site last October and is still in start-up mode — didn't return calls seeking

comment. In a statement issued last week, iParty CEO Sal Perisano said the acquisition of The Big Party stores "will allow iParty to operate as a complete multichannel retail provider."

The brick-and-mortar stores are expected to be "significant traffic drivers" for both the iParty.com Web site and an offline catalog business the company also operates, Perisano said. And the deal should give iParty a more solid revenue base that will improve its ability to acquire other direct-marketing companies within its retail niche, he added.

Seema Williams, a senior analyst at Forrester Research Inc. in Cambridge, Mass., noted that the deal is the reverse of the trend of brick-and-mortar companies purchasing dot-coms "as a cheap way to get in" to the Internet. But Williams said she doesn't see the iParty move as a sign of things to come.

"Because most dot-coms are in such bad financial shape," the move toward the clicks-and-bricks model will continue to mean Old Economy companies will be doing the buying, she said. "Nobody's going

to be picking off a Kmart too soon," Williams said.

For this year's first quarter, iParty reported a loss of \$5.5 million on sales of just \$146,834. During the spring, the company said it had hired John Jolly, a former executive at Denver-based online toy retailer KBkids.com Inc., as chief operating officer.

The deal announced last week doesn't include 21 other stores run by The Big Party, which has annual sales of about \$69 million. The agreement also has a twist: Perisano and his wife — who is also an executive at iParty — were two of The Big Party's co-founders eight years ago and worked at the company until 1998. ■

Continued from page 1

## E-Retailers

tailers that once envied and bemoaned their dot-com rivals' seemingly bottomless pits of cash are now seeing the tables turn a bit in their favor. Analysts noted that the traditional retailers can piggyback advertising efforts among their multiple channels and more readily invest in and leverage their infrastructure and fulfillment operations to handle increasing levels of online shoppers.

But even many traditional retailers are watching their steps as they delve deeper into online this holiday season.

"We're definitely seeing more conservative investment in the technology and a lot more evaluation relative to a vendor's credibility and vision. [Retailers] are more frequently putting vendors through the paces around ROI, which we

weren't seeing last year," said Carol Ferrara, an analyst at Stamford, Conn.-based Gartner Group Inc.

Most of the online-only retailers "that matter have managed to find money," said Forrester Research Inc. analyst Seema Williams.

Cash-starved dot-coms with life and death at stake, on the other hand, are continuing to try to creatively beef up their sites and shore up fulfillment so they don't fall victim to Federal Trade Commission fines for late deliveries, as seven online retailers recently did [News, July 31].

"There's a big shakeout that's looming. It's going to show the strong retailers from the weak ones, who really shouldn't be in business to begin with," said Heather Dougherty, an analyst at Jupiter Communications Inc.

David Fry, president and CEO of Fry Multimedia Inc. in Ann Arbor, Mich., said that this summer he has noted an in-

crease in dot-coms offering equity stakes rather than cash for his firm's design and development services. Fry said one dot-com offered equity in exchange for his firm providing and hosting servers needed to get through the holiday season.

"These companies have their backs to the wall. They have to do this to stay in business, and it's harder to get cash than it was six months ago. They're looking for whatever opportunity they can to avoid spending cash," said Fry.

Deloitte & Touche LLP senior manager Lindsay Parker said her company is working with one primarily pure-play online retailer that wants to acquire a company that would bring the infrastructure pieces it needs for long-term survival. "They've got another six to nine months" before they burn through their cash, Parker said.

"They're trying to pick [acquisition] targets that have some incremental positive revenue that will offset the [acquisition] expense and have a net zero impact on their burn rate," Parker added, noting that she's heard buzz from other firms with similar aims.

Ratcheting down advertising is one way for online retailers to try to hang on or reach profitability sooner. FTD.com Inc. CEO Michael Soenen said his company expects to spend \$17 million to \$20 million this year on advertising, compared with \$42.9 million last year. The bulk of the cuts, he said, will be in television and print. Downers

## Amazon, Toysrus.com to Join Forces

Amazon.com Inc. and Toysrus.com Inc. last week announced that they're teaming up to launch a new co-branded online toy and video game store this fall and a baby products site in the first half of next year.

"[The alliance] will allow both of us to reach profitability before we would have [on our own]," Jeff Bezos, founder and CEO of Amazon.com, said.

Under a 10-year agreement, Toysrus.com will identify, buy and manage the product inventories, and Amazon will be responsible for Web site development, order fulfillment and customer service.

Both Amazon and Toysrus.com have had problems recently. Toysrus.com was fined last month by the Federal Trade Commission for making late deliveries during last year's holiday season.

And Amazon has been hit in the past few weeks by an \$89 million second-quarter loss, the resignation of its CEO and a pricing glitch on its Web site (see story, page 14).

Analysts said the deal will allow both companies to focus on what they do best.

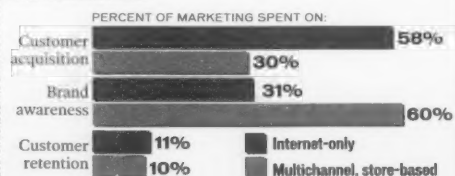
"This is a very good synergy," said Greg Girard, an analyst at AMR Research Inc. in Boston.

"Amazon.com seems to have overextended itself and is looking to Toysrus.com to provide it with back-end fulfillment and inventory management," said Alan Alper, an analyst at Gomez Advisors Inc. in Lincoln, Mass. "And Toysrus gains credibility by teaming up with Amazon, which handles the customer experience better than most any other online retailer."

— Linda Rosencrance

## Target Customers

Internet-only companies spend most of their advertising dollars on acquiring customers, while store-based retailers concentrate on brand awareness.



Base: 221 retailers

SOURCE: BOSTON CONSULTING GROUP SHOP ONLINE STUDY

Grove, Ill.-based FTD.com does plan, however, to continue its more productive portal deals and various direct marketing initiatives. And of course, the online operation benefits from any advertising its 90-year-old parent does.

Drugstore.com won't be doing any TV or broad-scale advertising the rest of the year "because it didn't deliver the results we were looking for or would expect from that type of expenditure," said Williams. Instead, it will "focus on things we know work better," such as direct advertising with affiliates and associates such as Amazon.com Inc., he said.

To better target its marketing efforts, Fogdog Inc. plans to do more extensive customer data analysis, supported by its new fully redundant Network Appliance Inc. storage system, said Robert Chea, the Redwood City, Calif., retailer's chief technical officer.

"We spent this whole year building up the infrastructure that will support the holiday season. We haven't had to scale back anything, because we made the purchases a while back," said Chea, noting that the company also upgraded its switching infrastructure and added more servers and still has \$50 million in its coffers. ■





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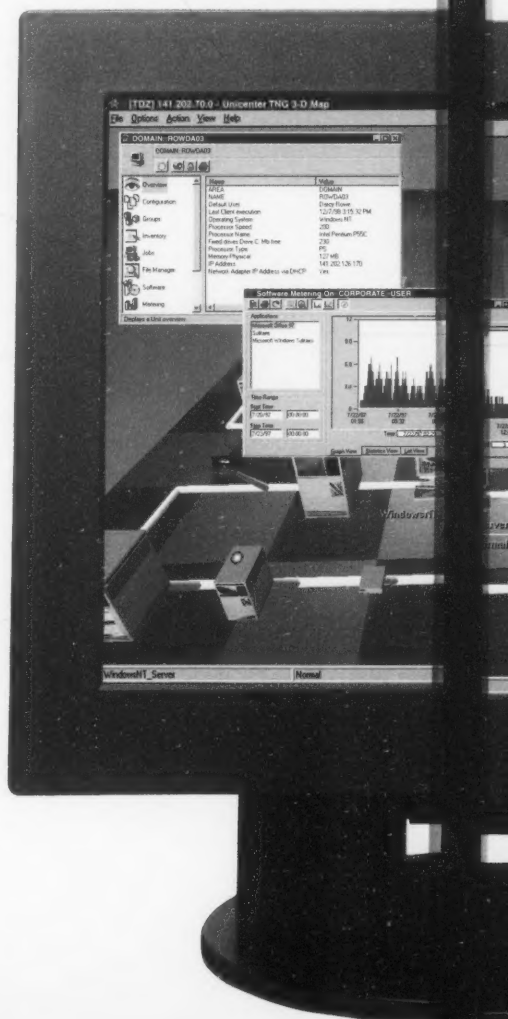
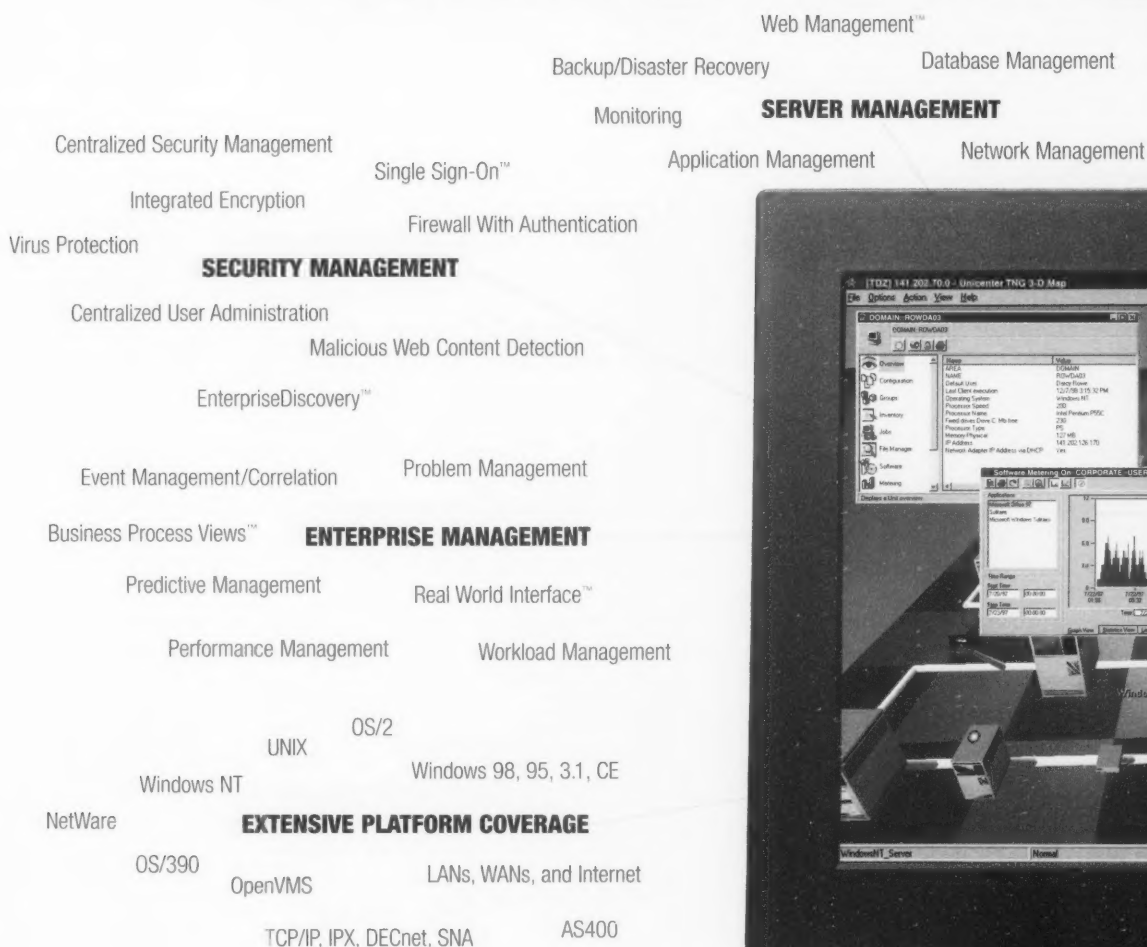


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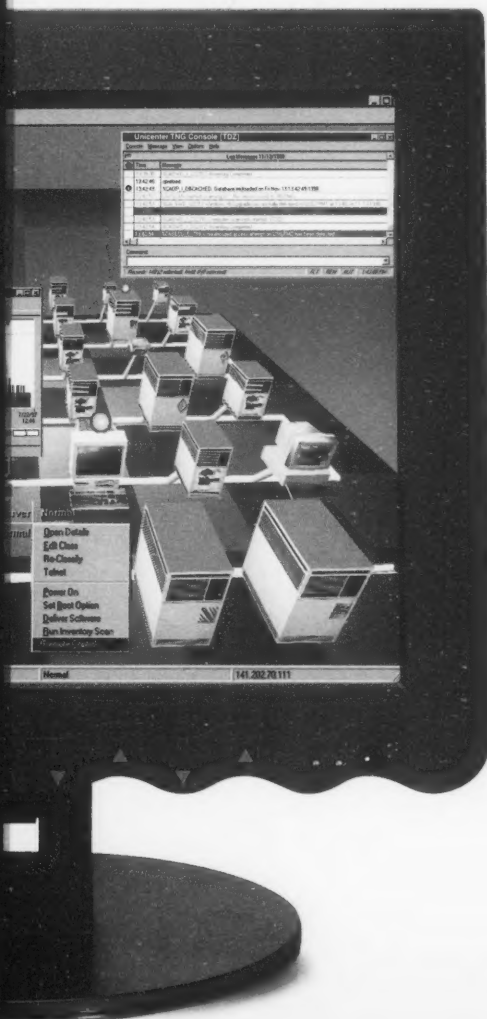
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## Online Travel Deals Make for Strange Bedfellows at Sabre

*Firm selling its products to rivals*

BY MICHAEL MEEHAN

For Sabre Inc., which runs one of the airline industry's largest computerized reservations systems and Internet-based booking agency Travelocity.com Inc., the growth of the online travel industry is putting the company in all kinds of interesting positions when it comes to sorting out its friends and its foes.

Earlier this month, for example, Hotwire.com — an airline-backed venture that plans to start selling discounted plane tickets via the Internet next month — announced a deal with Sabre in which Sabre will provide the necessary connections between Hotwire's Web site and the airlines on which its customers will book flights. Sabre will also provide fare-searching capabilities and manage reservations for Hotwire, the two companies said.

### Building Up Business

With six of the seven largest U.S. airlines acting as silent investors in Hotwire, the San Francisco-based company is positioning itself as a challenger to Norwalk, Conn.-based Priceline.com Inc. in the online discount-fare business.

But Sabre is now a key technology provider to both Hotwire and Priceline. Last month, Fort Worth, Texas-based Sabre said it had signed an agreement to handle some of Priceline's reservations, which pre-

viously were handled exclusively by Atlanta-based computerized reservations system provider Worldspan Inc.

The deals with Hotwire and Priceline also create the likelihood that Sabre will book flight reservations in competition with its own Travelocity unit. But that's just the nature of the Internet, said Tom Klein, president for emerging business at Sabre.

"We're looking for diverse business models in the e-commerce world," Klein said.



**SABRE'S KLEIN:**  
He welcomes the competition

"We want to be the largest provider of business-to-business products on the travel side, and sometimes that means dealing with [multiple] competitors or competing against ourselves."

Another twist is Travelocity's vocal opposition to Orbitz, a soon-to-be-launched airline ticketing site funded by the nation's five largest airlines. Last month, Travelocity CEO Terry Jones claimed at a Senate Commerce Committee hearing that Orbitz would pose a threat

to fair competition by allowing the airlines to offer exclusive fares via the Orbitz Web site.

Chicago-based Orbitz insisted that it won't offer special deals that undercut fares that are available through other travel agents.

Orbitz spokeswoman Carol Jouzaitis said Sabre's deal with Hotwire indicates that there may be some gamesmanship involved in Travelocity's opposition to Orbitz. "It appears Sabre doesn't think airline-backed sites are that bad, particularly if the money's green," she said.

But Klein said Sabre doesn't

see the same kind of threat in Hotwire that it does in Orbitz, because the airlines don't have as prominent an ownership role in Hotwire. "The primary issue is not whether Orbitz should or should not be in business," he said. "It's that they need to make information available in a fair and equitable way."

Hotwire CEO Karl Petersen noted that his airline investors are nonvoting partners.

Petersen said he sees no conflict in having Sabre support his site along with Priceline's and Travelocity's. Hotwire is developing front-end ticket auctioning capabilities and needed a reservations system to provide it with schedules and flight-booking capabilities, he explained. ▀

## Bankers Group Pushes Its Seal of Approval

*But some question significance to consumers*

BY MARIA TROMBLY

**I**N THE WAKE OF A recent warning by the Office of the Comptroller of the Currency (OCC) about fake bank sites conning customers out of private information, the American Bankers Association (ABA) has launched a campaign to increase awareness of a seal of approval it says verifies which online banks are fake and which are real.

But the SiteCertain seal is being used only by just over

300 banks out of about 10,000 in the country.

"I don't know that it means that much to customers," said Brooke Newcomb, an analyst at Forrester Research Inc. in Cambridge, Mass. "There's just too many seals of approval out there."

Newcomb said most consumers are still reluctant to go online for financial transactions and that the presence — or absence — of a seal isn't going to make a difference.

Britton & Koontz First National Bank in Natchez, Miss., has had the seal on its home page since the seal debuted a year and a half ago, but no customers have commented on it.

"I don't really know how much effect it has at this time," said the bank's president and CEO, Page Ogden. "But this kind of thing is going to become more and more important."

Banks are waking up to the increasing risk that their sites will be spoofed and their customers defrauded, according to Stephen Schutze, e-strategies director at the ABA in Washington. He said banks are

signing up for certification in increasing numbers.

"Sometimes, it takes something like a warning from the OCC that says, 'Hey, there's bad guys out there trying to take your customers' money,'" Schutze said.

But according to analyst George Barto, an online banking expert at Stamford, Conn.-based Gartner Group Inc., if spoofer were to mimic a bank site to con consumers, they could just as easily mimic the SiteCertain button.

"Even if the bank I was spoofing didn't have that certification, I would put it on," he said. "And I could not only spoof the button, I could spoof a Web page that looks exactly like the one that comes from the ABA. And since people don't know what that page looks like, it doesn't even have to look the same." ▀

## Gartner: ASP Market Growth, Shakeout Ahead

BY MARK HALL

Analysts at Gartner Group Inc. are predicting exceptional growth in the application service provider (ASP) market — and enormous fallout as well.

The Stamford, Conn.-based market research firm said that last year, ASPs racked up barely \$1 billion in revenues, but by the end of this year, the online purveyors of subscription software will generate \$3.5 billion in revenues. And Gartner estimated that by the end of 2004,

ASPs will top \$25 billion in business worldwide.

Gartner analyst Benjamin Pring said user adoption of ASPs isn't limited to small businesses. He noted that Fortune 500 companies are rapidly using ASPs to augment their information technology operations, with both horizontal and vertical applications.

Competition among ASPs will create a number of victims. Take, for example, last month's announcement that

high-profile ASP Pandesic Inc. in Sunnyvale, Calif., was ceasing operations.

Pandesic's demise is indicative of much more turmoil to come, according to Gartner analyst Audrey Apfel. She said 60% of the ASPs in operation today will fail or be acquired by the end of next year.

Part of the reason for the upheaval, according to Gartner, is the ease with which ASPs can enter the market and the fact that most of the soft-

ware being subscribed to is horizontal, or used in many industries. In fact, Pring said, 35% to 40% of ASP offerings are human resources applications. That means pricing pressure will be high for ASPs selling similar services.

Apfel said ASPs must make good on promises of quality service and earn a top position in one specialized facet of business, like customer relations management or what Gartner calls "end services" such as customization or integration. "The one-stop shop doesn't work," she said.

In the industry shakeout to

come, many smaller ASPs, particularly those struggling to carve out a brand identity, will fall away, Apfel said. Sixty percent of the 480 or so ASPs in business at the end of this year will be gone by the end of next year because of bankruptcy, lack of venture capital, mergers and traditional competition, she said. The projected number of enterprise-class, full-service retail ASPs in 2004 is 20, she said. ▀

Reporting by George A. Chidi Jr. at the IDG News Service bureau in Boston was included in this article.



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# SUN iFORCE™ PROVIDER IT

## Evolve listens to Voyant's voice technology

**W**hen Evolve Communications Inc. decided to push the envelope on Web conferencing technology, engineers at the company knew bulletproof voice conferencing was a prerequisite. Voice, after all, would form the foundation for Evolve's industry-leading Internet and wireless capabilities. For Louisville, Colo.-based Evolve ([www.evolve.com](http://www.evolve.com)), the importance of this technology meant there was only one possible partner: Voyant Technologies Inc.

Voyant ([www.voyanttech.com](http://www.voyanttech.com)), a Sun iForce Partner, provides a platform for intelligent voice applications. Formerly a division of Frontier Communications, Westminster, Colo.-based Voyant be-

came an independent company in August 1999. Its goal: allow telephony service providers to integrate voice applications over the Internet, and help Internet companies deliver intelligent voice to their customers. With deep roots, Voyant knows a thing or two about helping business make the most of voice technology. The company boasts more than 200 companies, many of them Fortune 500 corporations in 22 countries.

Four years ago, Voyant Technologies decided the time was right to revolutionize the industry and expand its line of offerings by creating ReadVoice, a next-generation intelligent voice-conferencing application. Built from scratch using InnoVox, Voyant's carrier-class

hardware platform, ReadVoice allows fully automated conference calling and supports virtually unlimited capacity. With ReadVoice, end users can initiate and control teleconferences using easily understandable interfaces: touch-tone telephones and browser-based Web controls.

### DRAMATIC EFFORT

In creating ReadVoice, Voyant wanted dramatic results — so the company took dramatic steps. "We took a development team and sent them off site," recalls Chief Operating Officer Dick Schulte. "We said, here's a clean sheet of paper, now go design the next generation of conferencing." The size of the team accorded over time, but gener-

ally speaking, seven developers worked at a separate facility. "To create the next-generation technology," Schulte says, "we had to separate an engineering team and let them create."

In addition to the InnoVox platform, Voyant knew the rest of its hardware and peripherals had to meet service providers' standards for capacity, fault tolerance, redundancy and ease of maintenance. This made it an easy choice to go with Sun Microsystems Inc. servers. Voyant relies on Sun servers and Solaris software to host and serve the Conference Allocation Control System — the very core of ReadVoice. The Sun server stores client information and billing data, and routes customers automatically to their conference call.

What Voyant had in mind was an advance that would change the

## Sportvision and PVI get Super Bowl to the 'Net

**Y**ou may not have heard of Sportvision. But if you watch NASCAR Winston Cup racing, NFL football or NCAA Final Four basketball, you've seen the Lawrence, Kansas, company's work.

Sportvision is a leader in animated sports technologies that explain sports to fans. For example, during February's Daytona 500 on CBS, casual viewers saw animated explanations of drafting, pit stops and various handling problems. The company couples innovative, proprietary technologies with in-depth sports expertise to create interactive sports features.

And those features are seen everywhere. On the Internet, Sportvision animation is used by CBS Sportsline, Yahoo! Sports,

NFL.com and USAToday.com. On television, you've seen the company's award-winning work during broadcasts of NFL, NBA and NCAA events. In addition to glitzy television broadcast animations, Sportvision appeals to players and coaches with innovative tools such as playbook animation software and instructional videos.

The company was formerly known as Coach's Edge, but was acquired by New York-based Sportvision Inc., a company that develops technology-based enhancements for the Internet, sports television and new media platforms.

In January, with Super Bowl XXXIV approaching, Sportvision needed fast turnaround on an unprecedented project:

The company turned to Peripheral Vision InfoSystems Inc. ([www.gopvi.com](http://www.gopvi.com)), a Sun Microsystems iForce Channel Provider. Headquartered in Overland Park, Kansas, PVI offers extensive consulting, integration and project management services to an impressive group of clients that includes Draper Laboratory, Egghead.com and E\*Trade. PVI is renowned for assessing clients' existing systems and extracting maximum horsepower from those systems. The company offers consulting and integration for network security, Internet/Intranet/Extranet services, Java programming and the design, development and adminis-

tration of databases. If the project was a success, Sportvision says, the company knew it would "help us generate greater income and secure additional contracts in all sporting events."

Sportvision says the decision to go with Sun hardware was a no-brainer because of scalability, reliability and availability needs — and also, the company says, "because we believe Sun has the capability to remain ahead of the high-end technology curve, which is critical in the new broadband arena."

Sportvision needed a unique application. The ambitious goal was an interactive experience that would be delivered over the World Wide Web as a simulcast or Webcast in conjunction with the Super Bowl. In order to pull it off, the



# LEADER PROGRAM

very business model of the industry. Most conferencing systems were (and remain) reservation-based. ReadVoice created a subscription model. If you're a subscriber, Schulte says, "you dial in, you enter an access code, you start a conference."

Eliminating the need for reservations is a big win all the way down the line. Voyant's immediate customers, service providers, slash their costs (reservations account for as much as half that cost). And end users gain the ability to simply launch a meeting whenever the spirit moves them.

Moreover, using Voyant's InnoVox platform and open application programming interfaces (API), businesses and developers can add voice to such diverse applications as customer relationship

management (CRM), Internet conferencing, even enterprise resource planning (ERP). Voyant states ambitiously that its mission is to embed voice in every Web application. The ReadVoice project launched in late 1998. Today, there are more than 20,000 ports worldwide.



## NEW PARADIGM

Evoke can vouch for the robustness and adaptability of ReadVoice. Evoke specializes in melding traditional technologies such as telephony with emerging technologies — wireless, for example — to create a single, ubiquitous, powerful communication platform for some of the Internet's most-visited sites.

According to Todd Vernon, Evoke's chief technology officer, the linchpin of such an advanced

platform is a completely reliable voice system. "We use Voyant technology behind our Web conferencing technology," Vernon says. Evoke has been using Voyant's multipoint control units for about two years. Multipoint control units connect conferenced telephone lines.

"When you buy a ReadVoice platform," Vernon says, "you get a specialized piece of hardware that phone lines terminate into." Voyant delivers multiple servers, he adds, that "connect into a single Sun box that acts as a gatekeeper or controller." Evoke itself uses 4-processor Sun E-450 servers.

Vernon appreciates Voyant's robustness and reliability. "They provide a very stable platform," he says. "It's just something we don't have to worry about. There are others in this space, but they're not as good as Voyant."

company would need to merge raw statistics with cutting-edge visual rendering tools, thus fundamentally changing the way fans experienced what has long been the biggest sporting event in the U.S. Sportvision sought to develop a companion to CBS' TV broadcast that would be interactive, fun, educational, seamless and instantaneous for all Net surfers, whether they enjoyed broadband Internet access or made do with dial-up access. This meant that PVI had to make the applications extremely scalable, fault-tolerant and highly available.

After careful thought, PVI decided Sportvision required a combination of applications and strategies — both an electronic-business solution and a custom-built solution. This combination would be unique. Moreover, the amazingly tight deadline (only three weeks

## The Award Program

The Computerworld Custom Publishing and Sun Microsystems sponsored contest recognizes innovative Sun implementations around the world. End users were invited to submit their Sun "channel provider-developed" implementations. The winners were chosen by IDC based on the uniqueness of the solution and its value to the host organization. The winners' stories appear in Computerworld during July and August and online at: [www.Computerworld.com](http://www.Computerworld.com)

were allotted) dictated that PVI modify its very delivery methodology and technology. PVI and its president and CEO, Scot Kane, modified the existing methodology and delivery mechanism to better support real-time delivery of the applications. Another critical goal was to provide massive scalability for both narrow and broadband access. This was

important because the applications were incredibly rich — users had hundreds of selection options — and provided a unique perspective on the Super Bowl.

PVI took charge of the project, coordinating the several vendors and customers who worked together to modify code for the ambitious, hard-deadline undertaking. In the end, the project was completed on time and showcased Sportvision technology for millions worldwide.

Sportvision says PVI was the "natural choice" for the project. "We needed to create the most highly available and redundant application serving environment possible," according to the company. "And we wanted a system that would provide the greatest scalability in terms of unknown quantity of users. Sun and PVI gave us what we wanted and more."

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## The Value of Certification

Situated between the manufacturer and the end-user customer, channel partners are continually evolving their business models to ensure that they stay competitive in the fast-paced IT industry. To accomplish this, channel partners need to have a solid understanding of the technology on which they are building the solution, and customers need to know that the partner has the expertise. These solutions are often mission-critical and must be implemented in Internet time.

Supplier certification programs are designed to provide the partner the knowledge required to effectively work with the products. Successful completion of a certification program often allows the channel partner a higher level relationship with the supplier, because some suppliers allow only those that successfully completed certification access to the equipment. Certified partners are also recognized by the supplier as those that have made a commitment to the vendor. They may be the only partners allowed additional benefits such as leads, access to engineering or resources such as demo equipment, and inclusion or access to marketing programs.

While certification is costly to the partner, the benefits can outweigh the costs because it provides the customer a seal of approval. The supplier should have confidence in the partner, and the partner should make a clear commitment to the vendor.

With the introduction of specialized certification programs, channel partners can provide more in-depth training. This translates to added revenue as the solutions tend to be more complex. With the right training, the channel partner can increase their time to delivery and their value-added services.

But the benefits extend beyond just the program and commitment levels. A recent IDC study of end-user channel preferences shows the primary reason for dissatisfaction with their channel was lack of service and support. Through vehicles such as certification, the channel partner is equipped to provide the level of service and support required, allowing a higher customer retention and providing a win-win scenario for the channel, the supplier and the customer.

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# SCO's CEO Says Unix Sell-Off is 'Right Deal'

## Company plans to focus on Tarantella

**A**FTER SUFFERING two straight quarterly losses and watching its Unix operating system get overtaken in market share by upstart Linux, The Santa Cruz Operation Inc. (SCO) threw in the towel earlier this month and agreed to sell its Unix and professional services businesses to Orem, Utah-based Caldera Systems Inc. for about \$120 million in cash and stock.

Once the sale goes through, SCO plans to focus primarily on its Tarantella software, a middleware product that lets end users access applications running on various server platforms through their Web browsers. In an interview with *Computerworld's* Dominique Deckmyn, SCO cofounder and CEO Doug Michels discussed the Caldera deal and SCO's future.

**Q: Any regrets about the deal?**

**A:** No; this is the right deal at the right time, I think. This is the deal that's the best answer

for our customers, our employees, our shareholders and the industry as a whole. ... If you combine the recent antitrust actions [against Microsoft Corp.] and the excitement around open-source [software such as Linux], we are really seeing a time now where operating systems are an open question again.

People are open-minded, they're looking at choices, they're excited about open source. But they're worried about how do they buy it and how do they [make sure it's secure]. And I see an opportunity here to really affect the landscape, to have a significant impact on the future of the industry.

**Q: Do you think there was a way to keep SCO together?**

**A:** Sure; we could have played the cards lots of ways. [But] when you have an industry going through a major change,

you have to steer your company to try and ride that wave. It's a mistake to hide in the corner and say we can [just] keep doing what we've done before.

**Q: You've been critical of Linux in the past, describing it as a much less mature product than SCO's UnixWare operating system. Has it been painful to you to see Linux**

become so successful so fast - and to now see a Linux company acquire UnixWare?

**A:** Linux is the epitome of the open-systems revolution that has been part of my life for the last 20 years. I mean, Linux is what open systems is all about.

I haven't been down on Linux; I've been down on the way people have occasionally misrepresented or overhyped Linux as something it wasn't at the time. Linux is not the answer to everything; it's not going to feed the hungry of the world overnight. We were selling products that did solve some problems, and people would say you could use Linux [to solve those problems, but] at

that point in time, you couldn't.

It's hard sometimes not to get frustrated with mischaracterization. But we've always had great hopes for Linux, and we've always believed that Linux and open source had the potential to change the world in a positive way. It also has some real challenges, [such as] reliability and how do you deliver it and maintain it and support it over the long term. ... What we're seeing now is [that those issues] are starting to work themselves out.

**Q: With Tarantella as SCO's main product going forward, how do you look at the company's future?**

A: I think Tarantella also benefits from the fundamental change in the fabric of the industry. Twenty years ago, it was the microprocessor and the IBM PC. This time, it's the Internet, its ubiquitous connectivity and open standards that are changing the fabric of the industry.

That's why open source is possible — because we have tens of thousands of people communicating instantaneously around the world. . . .

We're seeing a major shift in the way people want to access computers. They want to do it through the browser and they want to do it over the Internet and [corporate] intranets. That is so different from where we were even a year ago, and radically different from where we were five years ago. ■

## BRIEFS

## Cisco Reports Strong Q4, Loses Key Exec


Cisco Systems Inc. last week topped Wall Street's expectations for its fourth fiscal quarter, reporting a 69% increase in net income and revenue growth of 61% for the three-month period that ended last month. But Cisco also said Donald Listwin - one of the San Jose-based company's two executive vice presidents and previously a potential successor to CEO John Chambers - is leaving to become president and CEO of a wireless and Internet communications software vendor being formed through a merger of start-ups Phone.com Inc. and Software.com Inc.

## Informix to Lay Off 500 Employees

Database and tools vendor Informix Corp. said last week it will lay off nearly 500 employees as part of a restructuring plan that has condensed its five business areas into two units. After the job cuts, Informix's total head count will be approximately 3,800. Menlo Park, Calif.-based Informix also revealed it will take a third-quarter restructuring charge of between \$75 million and \$90 million, followed by a further restructuring charge of between \$10 million and \$15 million during the first half of next year.

## Short Takes


**LUCENT TECHNOLOGIES INC.** in Murray Hill, N.J., is looking for a chief operating officer amid a management shake-up. **Harry Bosco** is retiring as group president of Lucent's optical networks unit. **Patricia Russo**, executive vice president and CEO of the service provider networks group, is also leaving the company. . . . **NOVELL INC.** has appointed **Carl Ledbetter** as chief technology officer, filling the spot left vacant after **Dave Shirk's** departure last month. . . . **Omaha-based AMERITRIDE INC.** said its CEO, **Tom Lewis**, has resigned from the company for personal reasons. . . . **ORACLE CORP.** said that its Internet Application Server **8i** will now support Linux and announced expanded partnerships with four Linux distribution companies.



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## **Bypass all the Net congestion.** CBS MarketWatch.com, ranked the #1 online

financial news provider by Media Metrix,\* saw its bandwidth consumption increasing by one percent per day. They needed a single provider offering faster, larger and more reliable IP, data and web hosting capabilities with the highest level of security for users. **AT&T Data & IP Services** provided a solution of high-speed **Internet connectivity, dedicated server hosting, ATM and private-line frame relay services.** And with the new **AT&T Ecosystem for Media** supporting an entire spectrum of digital media applications, media and entertainment companies can create, manage and distribute digital audio and video over the public Internet or a private network. CBS MarketWatch.com now delivers nearly ten million pages of financial data and news each day to approximately a half million people around the world. If your company needs speed and performance without the Net congestion, let AT&T take you there - **now.**



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\* Source: Media Metrix, May 2001

# Power Brokers Race to Trade On International Markets

*Promise of global stock trading on the Net spurs technical efforts, competition*

BY MARIA TROMBLY

**T**HE INTERNET has brought the world many things, and soon direct stock trading on foreign markets will be among them.

Yet what's behind that split-second ability to buy a stock listed almost anywhere in the world is a lot more than the modem and ETrade account a customer may see. It's a lot more than global adoption of IP, fiber-optic lines and common schema for XML, too.

It's a battle being waged on Wall Street, as the giant U.S.-based stock brokerages and their newer online competitors jostle for alliances to open their services to customers in new global markets. It's about regulatory bodies and the different broker standards used to try to curb fraud. And it's about language — of finance, technology and tongues besides English. And oh, yes — it's also about money.

DLJdirect Inc. in Jersey City, N.J., was among the first U.S. brokerages to offer online services in Europe last summer, according to New York-based Jupiter Communications Inc.

Like other nimble ventures such as Palo Alto, Calif.-based ETrade Securities Inc. and New York-based TD Waterhouse Group Inc., the online unit of New York-based Donaldson, Lufkin & Jenrette Inc. beat its larger rivals to the punch. Those companies have had customers and offices all over the world for years but were slower to move online abroad for the same reasons as in the U.S. — channel conflicts, legacy systems and a commitment to high-net-worth and high-touch customers.

The first traditional brokerage that was able to cross over — paralleling its successful strategy in the U.S. — was San Francisco-based The Charles Schwab Corp., which had operated off-line in Europe for many years, said Jupiter analyst Nick Jones. In fact, he said, Schwab pioneered online trading in the European market when it launched Charles Schwab Europe in April 1998.

"Traditional institutions [like Schwab] that are able to successfully launch an Internet strategy as part of their standard operation, rather than relegating it to the sideline of business, will do the best," said Dana Stiffler, an analyst at Newton, Mass.-based Meriden Research Inc. Schwab officials declined to be interviewed.

## Paths to the Web

But in Internet time, Schwab's early success is almost history, as its competitors race to catch up.

There are several paths. One is trod by global giants like Merrill Lynch & Co., which plans to leverage customers, overseas experience and brand recognition by Web-enabling existing brokerage services — though no online trading is yet available to customers overseas. Another is that of an affiliate of The Timber Hill Group LLC, which is leveraging exist-

markets were three to five years ago."

For its part, DLJdirect has gone the joint venture route in Asia with a year-old partnership with Tokyo-based Sumitomo Bank Ltd. Other joint ventures cover 14 countries in the Middle East. A Hong Kong service will be launched this fall — again, with local partners.

Why? Language and cultural differences, McFadden said. Plus, finding partners with strong brands and existing client bases doesn't hurt. Nor does knowledge of local trading regulations and systems.

"With the partners we have selected, we have achieved one of our primary goals — speed to market," she said. "We were the first online brokerage firm in Japan and the first major U.S. brokerage company to set up operations in Japan."

Online broker Ameritrade Inc. has also gone the partner-

## Foreign Affairs

*U.S. online brokers began moving overseas in 1998. The major Wall Street firms already had their foreign outposts but were slower to move to the Web.*

**ETrade:** Owns branches in France, Sweden, the U.K. and Canada; has partnerships in Australia, Denmark, Japan and Korea

**Ameritrade:** Has a partnership in Germany under the Deutsche Bank brand

**DLJdirect:** Owns a branch in the U.K.; has partnerships in Japan and 14 other countries in the Middle East and Asia

**Schwab:** Owns branches in the U.K., Hong Kong and Canada; has a partnership in Japan; Miami office offers Latin American Center

**Merrill Lynch:** Owns branches in 44 countries, but still offers no online trading overseas; has partnerships in Hong Kong, India and Indonesia

**Morgan Stanley Dean Witter:** Owns branches in 25 countries; has dedicated Web sites for Japan, India and Spain



ship route, with Deutsche Bank AG in Frankfurt, to provide access to U.S. securities for the European market.

"They have a good understanding of their customers, regulations and the different institutions and the technologies required to hook into them," said Jim Ditmore, CIO at Omaha-based Ameritrade.

ETrade has found partners in Australia, Canada, Denmark, France, Japan, Korea, Sweden and the U.K. over the past two years. As the company gained experience, it bought branches from licensees. And its recent purchase of Toronto-based Versus Technologies Inc. brings technology that will let ETrade consolidate orders and route them to the correct execution point.

This technology will form the basis for ETrade Global, said ETrade's Steven Ferrando, managing director of institu-

## Why Go Overseas?

That's where the growth is.

Percentage of population owning stocks:

45%

11%

Percentage of stock owners with an online trading account:

20%

4%

■ US  
■ EUROPE

tional and international deployments. "We have in fact launched the first wave, which starts out with Swedish customers trading U.S. equities," he said. "We'll be offering the ability for ETrade France and ETrade Australia to be trading U.S. stocks by the end of the calendar year."

### Technology Glitches

But even the partner approach doesn't mean the technical side is always a breeze.

Ameritrade picks partners based on their positioning in the market and the territory they cover, not necessarily their strengths in technology, Ditmore said. As a result, he added, Ameritrade is often called on to supplement the technology of the local partner — to set up dedicated communication lines, for example.

"The requested services range pretty widely," Ditmore said. But the process moves quickly. "We can actually get the entire link up with our foreign partners in under a month and have it working, typically, in two to three weeks," he added.

The technological hurdles are getting easier to overcome because of the Internet, said John McKinley, chief technology officer at Merrill Lynch.

"It starts with some things as simple as everyone converging on IP networks in communicating with one another," he said. "You're supporting a single solution, so there's a lower cost to connect market participants, from a hardware and systems software perspective."

In addition, he said, the evolution of data standards and, in particular, the transition to XML-based standards, is making life easier for everyone in the financial services industry.

Tying into new clearing systems — where trades are officially confirmed — can still

pose a challenge, said McFadden. Each country has its own computer systems for finalizing trades, but the integration isn't much of a hardship when local partners know the systems. Ditmore said he agrees local partners are key. "Each of the foreign exchanges has very complex regulations — and interfaces."

McFadden said she hasn't found that U.S. employees have many difficulties coordinating with foreign staffers, either. "The technology people all speak the same language around the world," she said.

But the differences in language and culture do create a need for dedicated Web sites.

McFadden said DLJ employs multilingual usability experts who travel to joint ventures overseas to work with local staff who understand the local market and culture.

Chicago-based Timber Hill was a longtime holdout against having Web sites in multiple languages but now has several foreign language sites, including ones in French and Chinese, in the works.

Most brokerages won't comment on the cost of all this expansion or early returns they may be seeing. But some are clearly big-dollar deals.

ETrade spent \$122 million in stock, for example, to buy TRI Holdings Ltd., a Dublin-based company that offers global stock trading in multiple currencies to institutional clients and is active in 35 nations.

Yet not everyone has those resources to spend.

"Globalization overall will hurt the smaller players who can't afford to cover the various marketplaces," said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup.

Some 65% of the membership of the National Association of Securities Dealers (NASD) is made up of firms with fewer than 10 employees. These firms may face the choice of either adding more employees to handle customers who decide to trade af-

ter hours — which may not be cost effective — or losing those customers to larger firms or online brokers.

Alan Davidson, a former member of the NASD board of directors and current president of the Independent Broker-Dealer Association, said he wants New York-based Nasdaq Stock Market Inc. to invest in technology to give its smaller members more access to after-hours and overseas trading.

"The technological barriers are not formidable, but they're not being addressed," he said.

Nasdaq declined to comment.

The largest firms face the opposite problem — they have too much staff, too many legacy systems and too much invested in satisfying existing customers — although some claim that those high-end clients want brokers, not computers, to make their trades.

"The high-net-worth clients want to speak with someone," said Veronique Weill, chief technology officer at J. P. Morgan & Co. in New York, which won't roll out its online service in Europe until at least the end of this year. "They're not looking for execution on the Web."

Time may tell. ■

## Trading Ticker

Ameritrade has seen online trading take off:

Broker-assisted trades

December 1994: 68%

March 2000: 13%

Other automated systems (such as touch-tone phone)

December 1994: 31%

March 2000: 4%

Internet trades

December 1994: 1%

March 2000: 83%

ROSEMARY MCFADDEN, director of global business development at DLJdirect, says that while "technology people all speak the same language," differences in language and culture create a need for dedicated Web sites

## Broker Seeks Retail Markets

BY MARIA TROMBLY

Greenwich, Conn.-based The Timber Hill Group is a brokerage that primarily served institutional customers — until its online trading arm, Interactive Brokers LLC, opened up its proprietary trading platform to retail customers in 1998.

Unlike most online brokerages, which are browser-based, Interactive Brokers asks customers to download trading software, which works over the Internet or a leased line. This offers customers faster executions and continuous price updates, said David Friedland, managing director of the company's Asia Pacific region.

Interactive Brokers has customers in 71 countries and connections to 39 exchanges in 17

nations, according to Timber Hill Chairman Thomas Peterffy. Each customer can buy and trade stocks in his own country, he said. In addition, most customers can buy U.S. stocks, and European residents can buy stocks in European countries.

The reason everyone can't buy stocks everywhere isn't technological — it's regulatory. Peterffy said it probably won't ever be possible.

"The SEC and the Commodities Future Trading Commission want to make sure that customers are protected," he said. "There will probably always be certain rogue countries that

come up with fake securities."

Analysts said they agree that technology isn't delaying global stock-market integration. "The main obstacle is regulations in various countries about who can buy and sell stock," said George Barto, an analyst at Stamford, Conn.-based Gartner Group Inc.

And Rosemary McFadden, director of global business development at DLJdirect Inc. in Jersey City, N.J., said her company will be ready to offer customers a greater variety of stocks when the

laws change. "The technology is the easier part of this," she said. "But regulators, by definition, don't move all that quickly even though clearly the technology has created a global financial village." ■



PETERFFY: Regulation is delaying global trading



MARK HALL

# Spam me

**I**T'S FASHIONABLE these days to decry spammers in the strongest of terms. After all, they sully the Internet with their tawdry come-ons. They clutter our mail queues and waste our time. They clog corporate networks.

But why all the fuss? Doesn't anyone but me have a delete key? In our zeal to deter spam artists, we go so far as to applaud organiza-

tions like the Mail Abuse Prevention System (MAPS), which last week won a court decision affirming its right to publish a list of companies accused of spamming. By using MAPS' list, Internet service providers can torch spam before it fouls your mail client.

Spammers are so distasteful that they have become central to America Online's legal argument in defending its approach to Instant Messenger. What AOL tells the court and the public is that it virtuously locks out competing instant messaging programs to protect us. AOL claims it has the "right" technology to employ on the front lines against spam. Those FreeIM competitors? Well, they'd leave the drawbridge down for barbarian spammers to pillage the Internet castle.

All of this rhetoric makes me worry a bit about the First Amendment implications of MAPS' vigilante approach to stopping spam. There's also part of me that scoffs at AOL's paternalistic tactics, just as the FreeIM lawyers did last week, chiding AOL for its "hypocrisy."

Most IT managers let the spam wars rage outside their domains. Like many service



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providers, they are deferring their antispam efforts to the work of groups like MAPS, whose Realtime Blackhole List includes spammers and the networks that carry them.

I'm not advocating that IT permit spam onto its networks willy-nilly. Yet I can't believe that managers should abdicate their responsibilities to others outside their organizations. It's an issue that even MAPS argues needs to be discussed openly.

I understand that spam is wasteful and annoying, but I also accept it as the trivial detritus of a complex medium.

Even though every letter I receive from the U.S. Postal Service doesn't turn out to be a personal note from a Pulitzer Prize winner, I don't want it to stop bringing me unrequested grocery store fliers or an appeal from the National Multiple Sclerosis Society. Let me judge the usefulness of the information for myself. In fact, I fear more those trying to protect me than those trying to spam me. After all, I can't use the delete key on something I can't see.

Spam may not be enshrined in the First Amendment, but dealing with it is a right I prefer to keep for myself. ▀

DON TENNANT

# Lane's departure ends the battle of egos at Oracle

**L**AST MONTH'S resignation of Ray Lane, Oracle's president and chief operating officer, reportedly came as a surprise to analysts. I had to laugh. The only surprise, given the clash of egos between Lane and CEO Larry Ellison, is that Lane stuck it out for eight years as Tonto to Ellison's flamboyant Lone Ranger persona.

I can remember sitting with Lane over breakfast in the coffee shop of the Grand Hyatt Hotel in Hong Kong back in February 1994, two years after he joined Oracle to head its U.S. operations. He was telling me all about how Oracle had been run by a bunch of "kids" who were so busy making money that they didn't take the time to build an infrastructure or a long-term business plan.

When I asked him what the company needed to get on the right track, his response was remarkably candid, if self-serving.

"The company needed some adults," he said.

"Even Larry. If you look at Larry's background, he's extremely bright and extremely worldly. . . . [But] this is a guy who's a programmer — very technical. So nowhere in his career did anyone tell him how to sell and distribute software or how to build organizations. Larry would be the first one to admit he doesn't know how to do that."

He would? A year later, I had a chance to find out for myself. Fittingly, I was sitting with Ellison in the exquisitely furnished presidential suite of the same hotel. I eased into the Lane question with a preface: I mentioned that Lane called him "extremely bright and extremely worldly."

"Ray is a very astute observer," Ellison replied in quintessentially Ellisonian style. It was perfect.

"Funny you should say that," I said. And I went on to recount what Lane had said about Ellison being the first to admit that he's clueless about selling software and building organizations.

"No, Ray would be the first one to admit it. I'd only be the second," Ellison responded good-naturedly. Yet he couldn't just let the comment slide. "Don't know how" is a bit extreme," he said. "It's very hard to figure out which comes first: lack of interest or lack of ability."

In any case, Lane's irreverence never waned. The last time I spoke with him, which was in November, he made it clear how strongly he dis-



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agreed with the business-unit accountability model that Ellison had implemented. And he acknowledged that he was frustrated. "I'd just like to do what I think needs to be done," he said.

That's why it's surprising that Lane put up with playing second fiddle for so long. This is a man who sees himself as the show-runner. Finally, the days of being down in the coffee shop are over. This guy wants the presidential suite. ▀

TIMOTHY C. HOFFMAN

## Finding the blessings, curses of technology

**H**OW MANY TIMES have we heard someone say, "I couldn't live without my computer"?

We live in a milieu unlike any other in human history. Technology has made many lives happier, healthier and smarter, albeit not necessarily wiser. If we look at the advances made in medicine in the past 10 years, we will note a major improvement in general health and longevity. This would seem to be a good thing. On the other hand, these same technological advances have presented us with some gut-wrenching decisions. Not even King Solomon could come up with answers to the questions that this man-made technological reality presents.

We can prolong the lives of terribly ill patients; we can create life in vitro ("test-tube babies"); we

can keep babies alive who are born as early as five months premature. What technology!

But is this the moral thing to do? Do we as a society have the right to choose who will live and who will die? Not to mention the technology involved in capital punishment that utilizes a clean, sterile, almost medical methodology in our executions.



TIMOTHY C. HOFFMAN is a licensed marriage and family therapist in Spencer, Mass. He has been in private practice for more than 25 years.

Let's examine how technology can be a blessing and a curse.

It's a blessing to have human contact and conversation. Shut-ins may now communicate with others via the Internet and not feel so alone. Through chat rooms, they can find mutual support for whatever is ailing or bothering them.

But that same technology is a curse when it can fool a youngster into believing that the person he's communicating with is another teen-ager when, in fact, it is a sociopath trying to hook a victim. This happens, and there have been victims swindled and murdered.

Two things struck me while visiting the Tall Ships 2000 parade in Boston last month. First, while looking at the map I printed out from the Internet, it dawned on me that men in these same kinds of vessels actually lost their lives while exploring the unknown world for the purpose of mapmaking.

The other thing that caught my attention was the number of cell phones being used. They were everywhere. We have so many ways of communicating with others, yet some people don't even know their next-door neighbors. We talk on cell phones while we only look at the strangers who live next door! Fascinating human beings are we.

The Internet can be a fabulous wonderment, but it can also unleash terrible addictions. There are addictions to sexual fantasies in chat rooms, gambling and compulsive buying. There are sports freaks who spend otherwise valuable time surfing for scores, and investors looking for stock quotes.

Meanwhile, parents who are enamored with technology don't see or appreciate the natural awe and beauty in their children. And children themselves neglect family and homework for cheap and "free" thrills through technology instead of concentrating more on working hard for good grades in school.

We really don't think of—and even aren't aware of—the power the Internet has given us: power to do good as well as evil. Aren't we like the children of Israel in the desert? I hope we make the same choice they did. When Moses presented the Israelites with the Ten Commandments, they were told: "I present you with a choice. Before you is the blessing and the curse. Life and death. Choose the blessing that you may have life."

I hope we are as wise as the ancient Israelites were and choose the blessing. Technology should be used with knowledge of it, respect for others and maybe even a little fear of its power. ▀

## READERS' LETTERS

### Movie ratings aren't a matter of law

**P**AUL KIRCHNER, in a letter on July 10, indicates that it is unlawful for minors to buy pornographic materials or purchase a ticket to an R- or X-rated movie. He implies that there is a contradiction between this prohibition and the unconstitutionality of the online child protection law. I believe Mr. Kirchner has confused a number of issues.

The prohibition against individuals under the age of 18 purchasing tickets to an R- or X-rated film is a contractual issue. The rating of a film is not a function of government, nor is it legally mandated. It is a voluntary system created by the motion picture industry.

Likewise, the movie theater industry has established a contractual position that it will not enter into a contract to rent a seat in its theaters to minors when it is showing films of this nature. No government prohibition has been established.

The Internet pornography industry has instituted a similar contractual prohibition for minors.

It requires an individual to provide information (credit card, etc.) to indicate that the individual is mature enough to use its products.

When Mr. Kirchner adds the question of a controlled drug (alcohol) to his equation, he further distorts the issue. The use of alcohol is not a free-speech issue. **Arthur L. Friedman**  
Garden City, N.Y.

### Distasteful flackery

**T**HANKS, Patricia Keefe, for nailing Oracle chief Larry Ellison on his hypocrisy regarding Microsoft ["People in Glass Houses," News Opinion, July 10].

One point that needs to be made: While Judge Jackson was unimpressed with the pseudo-independent voices bought and paid for by Microsoft, the buying of supposed experts for the purposes of influencing public opinion is distasteful and disturbing. As part of a larger societal trend, I believe it threatens our society in many ways, not the least of which is our inability to pick out factual information from the flood of flack-junk streaming our way. It's propaganda pure and simple, and it

threatens legitimate journalism as well.

**Norm Cimon**  
Systems analyst  
USDA Forest Service PNW  
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La Grande, Ore.  
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### Why jobs go empty

**A**NY CHANCE OF getting Meta Group Inc. to provide the skill sets, salary bands and locations for their estimated 400,000 vacant IT jobs in the U.S. ["Congress Blasts Poor IT Diversity Record," Business, July 24]?

From what I'm seeing, these jobs are vacant because companies don't want to pay what is being asked for and are looking for the high-skill/low-wage employee (code words for single parent, woman, minority, H-1B, green card, etc.). **Stephen Cooney**  
Project manager  
Hartford, Conn.  
steve@seadp.com

### Learning user needs

**E**D YOURDON's July 24 column ["Software, the 'e' Way," Business] regarding methods to identify end-user requirements during software development misses the mark in

one significant respect.

I agree that there have been many "hot" techniques that don't seem capable of adequately identifying user requirements. However, there's a core set of user-centric design methods that has been around for at least 20 years. These techniques work well to identify end-user requirements. They work in practical, project-oriented settings. They work in the accelerated development time frames typical of today's Internet-centric environment.

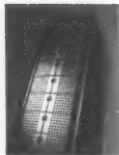
Many software developers and managers don't use these techniques, either through ignorance or the "it's not software engineering" syndrome. Hey, try 'em. Call your local human factors specialist for details. **Michael E. Maddox**  
Principal scientist  
Sisyphus Associates  
Madison, N.C.

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*It's time to focus less on **THE DOT***  
*and more on **THE COMMERCE.***

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DAVID FOOTE

## The real labor issues for the next president

**W**HO DOESN'T LOVE election year political theater? Candidates duking it out daily over dozens of the most perennially divisive political issues in the land. Just insert new candidates every four years, wind 'em up and watch the fun.

You might think this year would be different, what with all the hubbub over cyberspace economics and trade, Internet-related copyrights and intellectual property, H-1B visas and the shortage of tech workers and everything else having to do with riding the high-tech boom and easing our

country into the information age. Sure enough, if you visit the campaign Web sites of Al Gore ([www.algore2000.com](http://www.algore2000.com)) and George W. Bush ([www.georgewbush.com](http://www.georgewbush.com)), you'll find technology listed in the issues agendas and lists of ideas and promises from each camp.

What you won't find is anything substantial for the next Congress and administration, which will feel huge pressure to reform employment-related



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labor and tax laws that haven't fundamentally changed in four decades. That's very disturbing. These laws will choke our nation's attempts to field an Information Age workforce to meet the enormous challenges of the New Economy and maintain America's competitiveness globally.

Gore's main themes in technology and New Economy policy are to continue creating jobs and building a strong economy; cut taxes and increase investments to support high-tech research and development and spur innovation and growth; open up global markets in cyberspace to sell more U.S. goods; better educate the young; and train workers to assume their places in the "workforce of tomorrow."

Bush also wants to cut taxes, encourage investment in R&D, pursue free trade in cyberspace (with "sensible export controls"), reform education and create jobs. His mantra is to "encourage continued growth of the New Economy" and ensure opportunities so that "all Americans share in [its] benefits." Some of his other main technology themes: dramatically raising the H-1B visa cap; reducing frivolous lawsuits imposed on high-tech companies and small businesses; strengthening math and science curricula and creating community technology centers; and providing "assistive"

technology to the disabled. He would also appoint a government-wide CIO and provide a \$100 million fund to support interagency information sharing and electronic procurement initiatives.

But what will the new faces of 2001 do about the rapid disintegration of the basic corporate workforce model, which is built on command-and-control hierarchical principles but is stumbling badly now that speed and flexibility are so critical to innovation and growth? Who will lead debate over revisions to federal policies and laws that will encourage the proliferation of just-in-time workforces comprising short- and long-term temporary employees supplying diverse, adaptable skills — not the fortification of current laws and disincentives that constrain companies with static workforces of full-time employees?

At issue are numerous archaic codes and legal tests on the federal books that must substantially change as we usher in the New Economy of the Information Age, not stopgap measures and passive rhetoric we're hearing this election season.

Either the new president and the next Congress will show some long overdue leadership, or the courts will step in to decide issues related to tax and labor reform. Let's pray it's not the latter. ■

THORNTON MAY

## Human beings: A CIO's most important network

**A** FACULTY COLLEAGUE AT Carnegie Mellon University and I recently discussed the "other" network. During this chat, three other educators walked by and, hearing the conversation, thought we were talking about three different technological networks.

But they were mistaken. While this debate indicated that there are many networks for information technology leaders to worry about, the network my colleague and I were focusing on was the "human network" that lies at the base of all IT leaders' success.

I've long been convinced that the CIO's job is too big. This proliferation of "other" networks is just another example. Hillary Clinton says, "It takes a village to raise a child." In that same vein, it takes a transorganizational human network to manage IT. The days of the solitary, heroic man-at-the-helm kind of CIO are dead, gone and buried. If you manage your network of human contacts, the "other" networks will fall into place.

The leading expert on human networks is a

wonderful woman who used to be on the University of California at Los Angeles faculty, Karen Stephenson ([karen.stephenson@netform.com](mailto:karen.stephenson@netform.com)). In addition to being an archeologist, she has devoted massive effort to researching the behaviors of the modern tribes inhabiting our corporate jungles.

Stephenson has mapped out the human network, creating what some refer to as a *Cliffs Notes* for culture. Want to keep your job, be smart and fast and drive your costs down? Focus on building and strengthening your human network, she says.

Before we discuss the types of people to include in your network, let's examine the personality traits they must bring to the party:

1. They gotta be smart.
2. They gotta be — and stay — current.
3. They gotta be honest — their job is to stimulate your thinking in new perspectives.
4. They gotta be funny — nothing is less helpful than a bunch of blowhards who take themselves way too seriously.
5. They gotta be objective — they can't use this platform of trust to try to sell you something. No conflicts of interest.

Blanche DuBois, the heroine in Tennessee Williams' *A Streetcar Named Desire*, couldn't have been more wrong when she cooed, "I have always relied on the kindness of strangers." CIOs do this too often and find themselves not bumping into digital Samaritans, but rather falling into the hands of unscrupulous vendors.

Vendors tend to be blind to the realities of human networks. They're seduced by the visibility of organizational hierarchies. At the top of the hierarchy sits the budget brass ring. Or does it? Things actually get done through mechanisms not seen on the organizational chart — in human networks that extend outside the organization. Case in point: The supply-chain executives at a major clothing retailer had become seduced by an enterprise resource planning vendor. Seeking to reinject rationality into the decision-making process, the CIO flew in one of his network members, the CIO at a major computer retailer, to debunk the vendor's claims and document just how tough things could get.

If you were to run a diagnostic test on your human network, what would you find? Similar to managing a physical telecommunications network, the first step on the road to effective human network management is to create a map. Who do you know and more important, who knows you?

You're in trouble if:

1. You don't have an advisory board populated by brand-name CIOs and representatives from academia and the trade and business media, plus analysts from an investment house that covers your industry and research firms like Gartner or Meta.
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THORNTON MAY recently became chief awareness officer at Guardent Inc. in Waltham, Mass. Contact him at [thornton.may@guardent.com](mailto:thornton.may@guardent.com).

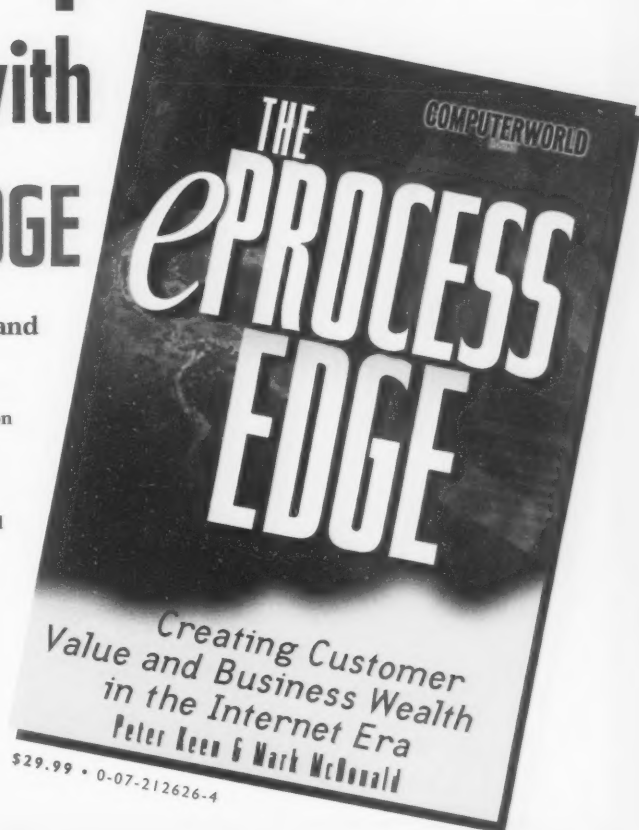
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—Venkat Srinivasan, CEO,  
*eCredit.com*



*Peter Keen* advises leading-edge eCommerce companies. In addition, he has taught at Harvard, MIT, and Stanford Universities. In 1994, he was profiled by *Forbes* magazine as "the consultant from Paradise."

*Mark McDonald* is an associate partner and director of Andersen Consulting's Center for Process Excellence.

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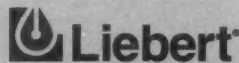
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# BUSINESS

## ASPs UNDER CONSTRUCTION

Contractors are finding big cost savings by turning to Cephren, an application service provider (ASP) that specializes in information technology tools to streamline large-scale construction projects. Many in the industry say that such services have helped cut costs dramatically but that standards among ASPs will bring further benefits. **▶ 36**

## PRIVATE MATTERS

Data about online customers is gold for e-commerce operations. But in their overzealous efforts to gather such information, businesses can wind up harming themselves more than helping, writes Kevin Fogarty. The answer, he argues, is strict federal regulation of the collection and use of online customer information, to help businesses steer clear of trouble. **▶ 36**

## DATA GUIDELINES

The top network advertisers, including DoubleClick, have agreed to a set of self-regulatory guidelines that could change the way e-commerce companies handle private online data. But privacy advocates say they're concerned that the guidelines don't go far enough and that smaller companies won't adhere to them. **▶ 37**

## KING OF THE NET

As tens of thousands of Elvis fans descended on Graceland last week for the 23rd anniversary

of his death, the official Elvis Presley Web site was relaunched. The night before the site went live, the media director of Graceland and one of the site's designers talked with *Computerworld* about what it's like to work on [www.elvis-presley.com](http://www.elvis-presley.com). **▶ 38**

## TIGHTENING MARKET FOCUS

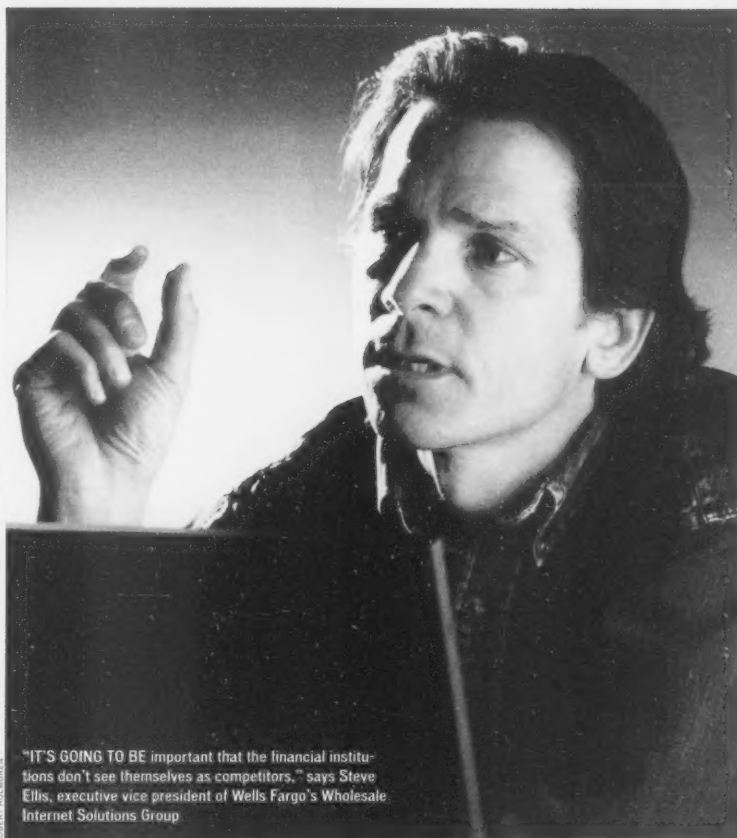
Banks, law firms, retailers and even malls are taking the ASP model a step further by turning to vertical service providers (VSP), which focus on specific industries. Businesses that use VSPs say their programming expertise and time-to-market acceleration are the top reasons for choosing them. **▶ 40**

## EASY CONTACT

Voice service providers are popping up to offer businesses a single number for their cellular, home and office phones and fax machines. The service also converts text messages such as e-mail into voice messages that can be accessed by phone. **▶ 41**

## CAMP BENTLEY

Campers at Bentley College's summer program are quick to stress that they're not attending a computer camp. In fact, the girls-only program, believed to be the only one of its kind in the nation, mixes business and technology to spark interest in business and IT careers among girls entering their sophomore and junior years of high school. **▶ 44**



"IT'S GOING TO BE important that the financial institutions don't see themselves as competitors," says Steve Ellis, executive vice president of Wells Fargo's Wholesale Internet Solutions Group.

## MONEY MAKES THE WORLD GO 'ROUND

ONLINE PAYMENT SYSTEMS HAVE been met with a great deal of resistance to date, but analysts say things are starting to change. New moves by start-ups and banks to close security gaps and open their doors to small and midsize businesses are helping to speed the acceptance of online business-to-business transactions.

# 42



## Large-Scale Builders Nail Down Savings With Outsourcing

*Application service provider targets construction and architecture outfits*

BY MARK HALL

Trying to get your electrician to connect with your carpenters during a kitchen remodeling project is a tough enough job. Imagine what it's like getting together dozens of subcontractors while building an urban light-rail system or an office high-rise.

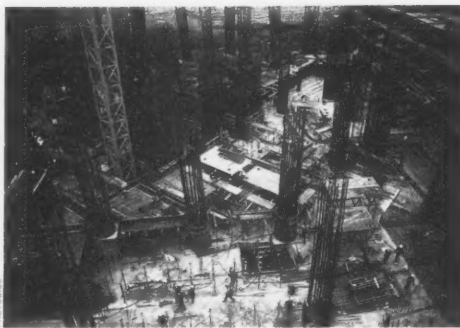
That's what application service provider (ASP) Cephren Inc. in Palo Alto, Calif., is attempting to do with its Web-based project management, collaboration and large-format remote-printing tools.

"In the past, we did everything pretty archaically, using voluminous rolls of paper sent by Federal Express," said Clifford Macaylo, vice president of supply chain at Fishback & Moore Electric Inc. in New Providence, N.J.

According to Macaylo, Cephren's hosted application hasn't completely eliminated paper from his life, but it has helped him reduce and control it. Most important, he said, it brings as much as 5% savings to the company's revenue by cutting back on time spent communicating with other subcontractors, paper costs and staffing needs.

"It may even be more than that," Macaylo said. "All you need is one litigation lawsuit, and I can justify more than that."

Central to any legal action in a construction project will be the hard-copy plans. Often, just sorting through mountains of blueprints and change-order forms can take weeks. Having those immediately accessible to investigators during the discovery stage of legal



**MASSIVE CONSTRUCTION SITES** like this one can be an organizational hassle among subcontractors. But ASP Cephren is changing that

proceedings will not only save time, but the parties are also likely to resolve issues before they go to court, Macaylo said. He pointed out that valid electronic sign-offs on documents of "who did what when" will be "irrefutable."

Webcor Builders Inc. in San Mateo, Calif., uses Cephren's

application to solicit quotes from suppliers. Webcor President Andy Bell estimates that his company pockets \$50,000 per project in savings and said that amount would quadruple if all his subcontractors got online.

The savings alone justify using an ASP for a given proj-

ect, Macaylo said, but he would like to see standards for integration with third-party applications such as Microsoft Project emerge among ASPs.

Macaylo said that during a construction project, the owner often dictates which information technology tools and ASP services to deploy.

"Standards make it easier to choose the right team," he said.

### Getting in Agreement

Analysts said they agree that data integration is a problem in the construction industry. But Dennis Byron, an analyst at International Data Corp. in Framingham, Mass., said he believes that if the building industry wants standards, it will need to drive them. Once the construction supply chain agrees on what it wants to see in its protocols and processes, he said, "technical people will follow."

Byron said he's confident the builders will succeed.

"This is the industry that makes a two-by-four in Massachusetts the same as a two-by-four in Kansas," he said. ▀

KEVIN FOGARTY/BRICKS AND CLICKS

## Be careful what you wish for

**O**FF THE COAST OF MEXICO a few weeks ago, a lone fisherman battling a 10-foot marlin was impaled when the fish leaped into the boat, spearing him through the abdomen.

Unable to handle the boat, the man drifted for two days until he was rescued by another vessel.

Just goes to show that sometimes an asset you've fought for can be a bigger liability than you ever imagined.

Now imagine being Toysmart.com, whose long, drawn-out death throes show just how complex it is to live and die on the Internet, where customer information and privacy become at least as important as the products you sell.

Forced by bankruptcy

proceedings to sell off its assets, Toysmart executives planned to put its customer data up for sale. But that asset (one of the few significant ones it had) seemed to

be tied up by Toysmart's previous privacy policy.

A deal with the Federal Trade Commission (FTC) almost cleared the sale, but the company got sandbagged by a judge who thought the deal smelled funny. The attorneys

general of 44 states agreed, filing a legal brief in bankruptcy court opposing it.

Toysrus.com, on the other hand, is facing two class-action lawsuits alleging that it violated its privacy policy by sending customer data to Coremetrics, a traffic analysis company. The lawsuits complain that Toysrus.com sent customer data to a third party. But Toysrus didn't sell the data, it hired Coremetrics to analyze its customers' online behavior.

This is the Web, where no one company does it all. Third parties host servers, maintain sites, serve ads, sell ads, provide content and analyze data. For once, a vendor's whiney defense is perfectly reasonable — which must be a first in the long, tawdry, mostly depressing history of how individual privacy is eroded on the

Web. Whether a judge will agree remains to be seen.

Then there's DoubleClick, a much juicier target for lawsuits and regulations when it comes to customer privacy. DoubleClick's follow-everyone-everywhere approach softened only last month under pressure from the FTC and the threat of federal regulations that would penalize it for customer tracking — the core part of its business.

### Empty Promises

DoubleClick and eight other network advertisers promise to follow a set of self-regulatory guidelines that, they swear, will limit the way they collect and use customer data and allow users to opt out.

That's nice, but somehow it fails to inspire much confidence. Self-regulation

was how Toysmart and Toysrus were handling the customer privacy issue, too. Customer data is the single most valuable thing on the Internet, to both e-commerce vendors and their customers. And I don't like to think that the privacy of millions of Internet users is dependent on how seriously advertisers and retailers take their privacy commitments.

Especially if they're out of business or on the edge of disaster, and they need to find assets to sell.

Federal regulations that will protect consumers from invasion of privacy and online fraud are the only way to avoid situations like the sellout at Toysmart and the confusion at Toysrus.

Without regulations to guide the honest and punish the wicked, consumers on the Web will continue to feel exploited and with a target painted on their bellies, watching that marlin's spike fly straight at them. ▀



**KEVIN FOGARTY** is Computerworld's Business editor. Contact him at [kevin\\_fogarty@computerworld.com](mailto:kevin_fogarty@computerworld.com).

## Web Advertisers Make Promises on Privacy

BY PATRICK THIBODEAU  
WASHINGTON

Some e-commerce companies may soon have to change their online privacy policies and practices as a result of a recent agreement between large network advertisers and the Clinton administration regarding online data collection.

In a landmark pact announced late last month, DoubleClick Inc. and eight other network advertisers, which collectively own more than 90% of the market, agreed to follow a set of self-regulatory guidelines for the collection of online data. The guidelines will ultimately affect e-commerce sites through new contract terms they will get from the network advertisers.

Federal officials said the advertisers will raise the bar on

online privacy for e-commerce sites. The advertisers said they hope the guidelines will slow efforts in Congress to pass privacy legislation. Other observers said they aren't sure what the effect will be.

"I'm not convinced that this will change anything in the near term," said Jordan Rosner, director of new media marketing at Pfizer Pharmaceuticals Group in New York. The guidelines will improve the practices of some big companies, he said, but there are still going to be firms "willing to take the risk of public backlash" over their privacy practices.

The Federal Trade Commission (FTC) applauded the self-regulation agreement developed by the nine network advertisers, known collectively as the Network Advertising Initia-

tive. But the FTC said privacy legislation will still be needed to ensure that advertisers that aren't part of the group comply.

Network advertisers supply banner advertisements but may also collect data on browsing habits largely through the use of cookies — unique identification tags placed on end users' computers. The agreement requires the consent of end users to collect that data.

But the agreement also opens the door to the most controversial aspect of online profiling: the merging of personal information, including names and addresses, with Web browsing habits — and sharing that information with third parties. Under the agreement, e-commerce sites that take this route will have to offer "robust" and explicit noti-

fication and give end users the ability to remain anonymous.

This provision has alarmed privacy advocates who say they fear that end users, who don't understand the implications of advertiser data-sharing agreements, would trust one advertiser with personal

data, then find it spread among many others.

"Clearly, if you read any advertising statement, they're not exactly neutral," said Andrew Shen, a policy analyst at the Electronic Privacy Information Center in Washington.

But the FTC can enforce the guidelines, said legal experts. If a company doesn't follow its privacy policy, it risks legal action for deceptive trade practices. "If a company posts a privacy policy, it better be accurate," said John Bentivoglio, a former chief privacy officer at the U.S. Department of Justice who is now an attorney at Arnold & Porter in Washington.

DoubleClick says it has no plans to begin merging personally identifiable data. In March, the New York-based company backed off plans to combine such data with information on Web surfing habits after facing wide-ranging criticism. ▀

### JUST THE FACTS

#### Low Profile

■ The Clinton administration-backed Network Advertising Initiative sets a number of self-regulatory guidelines for use in online profiling.

■ Web site users will be notified of network advertisers that profile activities on host Web sites and have the ability to choose not to participate.

■ End users will get "reasonable access" to a network advertiser's profiles about them.

■ Prohibits the use of sensitive personally identifiable information, such as medical, financial, sexual behavior/orientation or Social Security numbers, in online profiling.



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## WORKSTYLES

### What It's Like to Work on . . . www.elvis-presley.com

When Elvis Presley sang "King of the Whole Wide World" in the 1962 film *Kid Galahad*, little did he know that one day he'd also be king of the whole World Wide Web.

But 23 years after his death on Aug. 16, 1977, the king of rock 'n' roll is mentioned on more than 50,000 Web pages. Last Wednesday, Elvis Presley Enterprises Inc. (EPE) relaunched the official Elvis Presley Web site, just as 30,000



fans were expected to converge in Memphis for Elvis Week.

On Friday, Aug. 4, as EPE and its Web site design firm, Little Rock, Ark.-based Aristotle, prepared for a soft launch the following day, Todd Morgan, director of media and creative development at Graceland, and Nancy Mitchell, Aristotle project manager, spoke with *Computerworld* about what it's like to work on [www.elvis-presley.com](http://www.elvis-presley.com).

**What drove the new iteration of the Web site?**

**Morgan:** Half of the visitors to Graceland are under 35, so there continues to be an unbridled passion and enthusiasm for discovering Elvis. You just have to get Elvis and his work in front of people, and he does the rest. He's our marketing director emeritus, and he's still doing the job.

**How did you reward the staff for the time they put in this summer?**

**Mitchell:** We're throwing a surprise Blue Hawaii party. EPE sent us a cardboard stand-up of Elvis from *Jailhouse Rock*.

**What's EPE's take on all the other Elvis sites out there?**

**Morgan:** There are 600 independent fan clubs worldwide . . . and it's on our to-do list to have a means soon by which officially recognized fan clubs that have their own Web sites will have a link.

**Were you looking for a de-**

**sign firm with Elvis fans on board?**

**Morgan:** It isn't necessary to have the Elvis fever—we bring truckloads of that to the table. He's at the heart of everything we do. We really just needed the expertise to help us bring Elvis to the Internet. But it's a huge bonus anytime a company has that great feeling, and we find that most people do. . . . Once you get Elvis into your life, and he gets ahead of you, you're gotten for life.

**Mitchell:** We bid on the project because we have a real Elvis fan on staff who wanted to go for the job. And once we got it, our lead art director started listening to Elvis music nonstop to get inspired by Elvis.

**What's it like to work at Graceland?**

**Morgan:** There's a warmth that the place has, and the imprint of Elvis' spirit, of the life that was at Graceland when he was there. And in those quiet moments, you just shake your head at how privileged you are to be a small part of it every day. Whatever role we all play, we know that the effort matters to millions of people. It's a good gig.

**Do you have Elvis memorabilia in your office?**

**Morgan:** Hanging on my wall are two original Elvis movie posters that I bought when I was a tour guide here in '83: *Elvis on Tour* and *Elvis: That's the Way It Is*, because those movies were great moments for me from my childhood.

**Mitchell:** Everyone on our team at Aristotle now has a sticker of Elvis in his gold lamé suit. And we have Elvis pictures everywhere.

**Would Elvis have been a fan of the Web?**

**Morgan:** Absolutely, without a doubt. Elvis was always aware of new technology and was usually among the first to have it. He had a telephone in a briefcase in the '60s and a couple of sky-to-ground phones in his jets [the *Hound Dog II* and the *Lisa Marie*]. He had a big-screen TV in the mid-'70s. So he definitely would have been online as soon as it was available. He loved anything new.

—Leslie Goff  
(lgoff@ix.netcom.com)

PETER G. W. KEEN

## A flash from above

I RECENTLY LISTENED TO Chairman Bill (Gates, of course,) on the airplane audio channel on the way back from the West Coast after a meeting with Silicon Valley luminaries, which was preceded by a week of talking with CIOs at a conference. I flipped to Bill after getting fed up with the drone of bland-

on-bland background music. Truly bored. Tried Gates. He was talking at some conference on wireless technology. Truly, truly boring. Verbal Muzak. Flipped back to the serenades-to-send-you-to-sleep channel.

Stop! Woke up. That's it! That's the news for IT. Drone. Boring. Just what IT needs. Gates was talking about wireless and appliances that do whatever you want, how the Internet revolution is just getting started and that networks are creating "e-everywhere" (I think that's what he called it). I had heard the same general drift from CIOs and top executives across Silicon Valley—weeks of the same themes. Wireless is going to be big, so is XML; all appliances will have IP addresses; e-commerce will be truly, really, ginormously and utterly ultrabig. Oh, and broadband is coming.

OK, you may say this isn't news. But that's exactly the real news: no new news. For the first time in many years, IT has a pretty good sense of direction for what I call platform technology—the basics of infrastructure.

Windows 2000 looks like it'll be—at last—the stable, reasonably reliable core component of the platform. XML will solve many e-commerce problems, and broadband will increasingly liberate all aspects of information-media access and transfer. Everything in IT will evolve to being IP-based.

Unix, Linux and NT can co-exist and co-link. Java and Jini are the cores of new systems development, systems integration and links from front-end Web and e-commerce tools to legacy systems. The browser wars are over, as are the operating system debates. Sun has won the server wars. Enterprise resource planning is done. Application service providers aren't quite ready for prime time, but they're the future of software services. Oracle and SQL Server may not be the best technology environment, but they work pretty well together.

Of course, there will be many technology surprises and floods of innovation in the coming years. But for me, the key is that we now know

the blueprints of the enterprise platform for the e-commerce era.

Windows 2000 looks like it will provide what IBM offered for 30 years: a solid and reliable enterprise software base, plus a solid and reliable technical service and customer support base (though support and service haven't exactly been Microsoft's forte). XML is probably more important than Windows in the long run. So, too, for all its limitations, is the Wireless Application Protocol. Together, they begin to provide, if not the lingua franca for the next generation of e-commerce, at least the equivalent of English—a standard core language with plenty of dialects and variants, but no fundamental impediments to communication.

When broadband achieves critical mass, whether through third-generation wireless, cable TV or Digital Subscriber Line, useful innovation will be everywhere. What has happened with MP3.com will happen with every element of information: communication.

So, from 31,000 feet, the view of the IT terrain looks good. We're on top of things at last. We can plan ahead. We have maps.

But coming down to earth, what about the IT skill base for this new world? Chairman Bill didn't mention that. Nor did the vendors' CEOs or CIOs. Technology isn't the news. The news is the ever-more urgent need for diversity in IT, for sustained training and for new blood in areas such as digital content management for broadband, development of multimedia-based applications, object databases and next-generation business-to-business and business-to-consumer e-commerce. IT has the technology platform map. But where's the human resource map?

Technology is always really about people. We know where IT is going technologically. But in the skills and experience area, we're wandering in the dark. ■

Everything  
in IT will  
evolve to  
being  
IP-based.



Keen ([peter@peterkeen.com](mailto:peter@peterkeen.com)) is chairman of Keen Education in Fairfax Station, Va. His new book, *The eProcess Edge* (written with Mark McDonald) is co-published by Computerworld.



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# Vertically Inclined

A new twist on outsourcing emerges in the form of vertical-market application service providers, or VSPs.  
By Joanie Wexler

**B**ECAUSE IT'S GETTING tougher to be a jack-of-all-trades in information technology, the application service provider (ASP) market is veering off its original course to serve customers in specific vertical industries.

This new breed of ASPs, dubbed vertical service providers (VSP), focuses on delivering industry-specific application hosting and rental services to manufacturers, health care providers, retailers, financial firms and companies in other markets.

"The lion's share of ASP activity to date is happening in the vertical market space," observes Lew Hollerbach, an analyst at Aberdeen Group Inc. in Boston. "It makes sense to be specialized. ASPs in a particular market already know what their customers need and can add some additional services."

Hollerbach says prices for ASP services vary widely, depending on how broadly applicable the software is out of the box. Basic accounting applications from San Mateo, Calif.-based NetLedger Inc. run \$4.95 per user per month, he points out. Intact Corp. in Los Gatos, Calif., charges \$49.95 up front for the first two users, then \$4.95 per user per month thereafter.

At the higher end, hosted enterprise resource planning applications that need some tuning to a customer's individual business can run from \$10,000 to \$75,000 per month for an enterprise's user base, Hollerbach says.

Companies tapping VSP services tend to be dot-coms or other start-ups and organizations that are launching e-commerce arms of their traditional businesses. What these businesses have in common is an urgent need to bring products and services to market, so business demands take precedence over IT support. Early VSP customers cite a provider's access to programming expertise and time-to-market ac-

celeration as the primary reasons for turning to these third parties.

For example, when Los Angeles-based Express.com Inc. launched its DVD-based movie business in April 1997, it had four employees and filled four orders that month. A year later, the company had 80,000 customers but was still using a credit-check system that required employees to key in customer data, await an e-mail reply for verification and then contact a customer if the verification didn't go through, says Susan Daniher, Express.com's vice president of marketing.

The credit-check system "was not scaling in sync with our business," she says. "Our customer base was growing rapidly, and time was of the essence." The company turned to Pandesc LLC, a Sunnyvale, Calif.-based VSP that focused on the online retailing industry. Pandesc announced last month that it was shutting down operations but would help customers find a new provider [Page One, Aug. 7].

"Shopping cart, inventory management and credit-card processing were available right out of the chute," Daniher says. "We couldn't possibly have gotten such a system up and running ourselves." Daniher notes that Express.com grew from \$19 million in revenue in 1998 to \$71 million last year, thanks in large part to the automation in the Pandesc-hosted applications.

## Instant Banking

Digital Federal Credit Union, a \$1.1 billion (in assets) brick-and-mortar community bank in Maynard, Mass., didn't want to make a huge capital outlay when it opened an online branch about nine months ago. So it sought out the application-hosting services of Virtual Financial Services Inc. (VIFI), an Indianapolis-based VSP that offers a suite of online community banking products called InternetBanker.

The software automates check image delivery, deposits, account transaction histories and bill payments — all the core functions of a community bank, explains Jim Regan, senior vice president at Digital Federal.

The main reason for tapping VIFI was its expertise, says Regan. "As a company [in an area that's home to many high-tech firms and start-ups], it is a challenge for a small, private company like ours to compete for highly qualified people to manage our online delivery system long term."

Regan says his company has experienced few glitches since going live. He reports that application availability to his 75,000 active online banking customers is respectable — between 99.6% and 99.9% — though he says he wants 100%.

Even mall owners are jumping into the VSP fray. For example, Chicago-based General Growth Properties Inc.,

## A Cross Section of VSPs

Ten application service providers that serve specific industries:

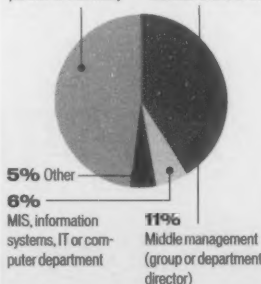
| VSP  | TARGET VERTICAL MARKET                       |
|--|--|
| <b>Casecentral.com Inc.</b><br>San Francisco<br><a href="http://www.casecentral.com">www.casecentral.com</a>         | Legal  |
| <b>DocumentForum.com</b><br>Stoneham, Mass.<br><a href="http://www.documentforum.com">www.documentforum.com</a>      | Legal  |
| <b>EchoPass Corp.</b><br>American Fork, Utah<br><a href="http://www.echopass.com">www.echopass.com</a>               | High-tech                                    |
| <b>General Growth Properties Inc.</b><br>Chicago<br><a href="http://www.generalgrowth.com">www.generalgrowth.com</a> | Retail                                       |
| <b>HotSamba Inc.</b><br>Schaumburg, Ill.<br><a href="http://www.hotsamba.com">www.hotsamba.com</a>                   | Manufacturing<br>(durable goods)             |
| <b>InfoCure Corp.</b><br>Atlanta<br><a href="http://www.infocure.com">www.infocure.com</a>                           | Health care                                  |
| <b>Medi.com</b><br>Thousand Oaks, Calif. (claims processing)<br><a href="http://www.medi.com">www.medi.com</a>       | Health care                                  |
| <b>RSM McOladrey Inc.</b><br>Minneapolis<br><a href="http://www.rsmmcgladrey.com">www.rsmmcgladrey.com</a>           | Financial,<br>distribution,<br>manufacturing |
| <b>TalkingNets</b><br>Wilmington, N.C.<br><a href="http://www.talkingnets.com">www.talkingnets.com</a>               | Telecommunications                           |
| <b>Virtual Financial Services Inc.</b><br>Indianapolis<br><a href="http://www.vifi.com">www.vifi.com</a>             | Financial                                    |

## Who Hires ASPs?

Who are the primary corporate decision-makers when it comes to buying services from an application service provider?

**48%** Executive management  
(CEO, president, owner,  
partner or chairman)

**30%** Senior management  
(VP, general manager,  
financial officer or CIO)



SOURCE: ZONA RESEARCH INC., REDWOOD CITY, CALIF., 2000

an owner and operator of 136 U.S. shopping centers, is rolling out a suite of retail-specific e-commerce applications that mall tenants can rent. These applications include high-speed transaction processing, training broadcasts delivered to point-of-sale terminals, sales data report generation and distance merchandising delivered via networked, in-store surveillance cameras.

"Our retailers don't have the time and resources to do all the research on which e-commerce applications to purchase and then install and maintain them themselves," says Charlie Graves, senior vice president of e-commerce at General Growth Properties.

The services are available in test sites at the Rivertown Crossings Mall in Grand Rapids, Mich., and will be rolling out over the next year. "A suite of about 50 applications will be available in all of our malls in time for back-to-school 2001," Graves says. ▀

Wexler is a freelance technology editor and writer in Campbell, Calif.

**T**OM O'KEEFE'S ATTORNEY called to say hello only to reach a very sleepy client in the middle of the night, several time zones away.

O'Keefe, president and chairman of Tulley's Coffee Co., was snoozing in his hotel room in Singapore, but that didn't stop his cell phone from bleating. The call, made to a phone number in Seattle, where O'Keefe lives and Tulley's is based, was seamlessly routed from the U.S. to the cell phone on O'Keefe's nightstand.

O'Keefe and more than 100 of his key employees get the service through AccessLine Communications Corp. in Bellevue, Wash., which, along with firms like MessageClick Inc. in New York, represents an emerging breed of advanced voice communications outsourcing.

These voice service providers are a far cry from consumer-oriented unified messaging Web sites that consolidate faxes and voice mail, such as Onebox.com in San Mateo, Calif., says Megan Gurley, an analyst at The Yankee Group in Boston.

It's easy to see why companies might be interested in farming out their voice services. A traditional corporate private branch exchange (PBX) costs about \$1,000 per employee to buy and install, says Brian Strachman, an analyst at Cahners In-Stat Group in Scottsdale, Ariz. Even one of the newer server-based systems costs about \$500 per seat, he says. In comparison, it generally costs between \$8 and \$20 per person

to use a voice service provider, say early customers.

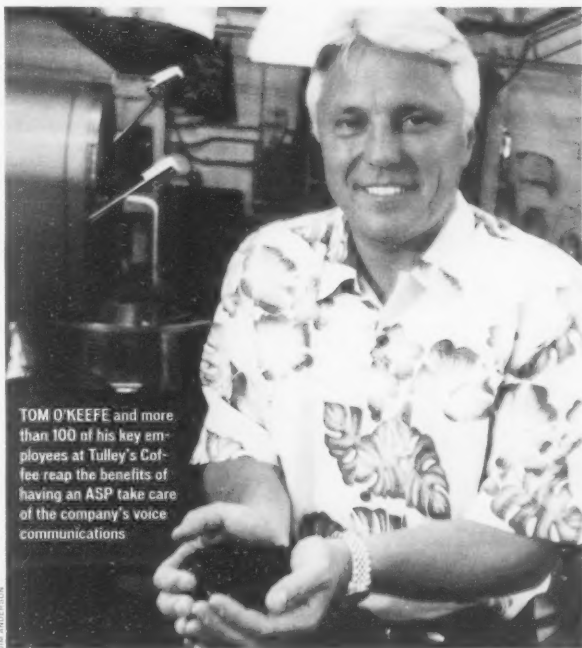
These figures, coupled with Cahners In-Stat's prediction in a recent report that large enterprises will become conglomerations of regional branch offices, may position voice outsourcing as a viable alternative to buying and building such systems in-house.

#### Ricochet Messaging

Although the new voice communications outsourcing offer voice mail and fax services through a single number and can be accessed via the Web like their consumer services brethren, they provide a lot more business-level functionality than consumer services vendors do, Gurley says. The big difference, say Gurley and customers like O'Keefe, is that a voice communications outsourcer that targets businesses gives individual users the ability to customize voice communications over the Web or through touch-tone phones, based on their work and travel patterns.

For instance, an employee who spends Monday and Tuesday at company headquarters, visits clients on Wednesday and Thursday and then works from home on Friday could program a single outsourced phone number to ricochet calls to his office, cell phone or home. From any phone, the worker could then screen and accept calls, access a single voice-mail account and check e-mail and faxes.

A system that connects employees moving hither and thither was just what Andy Pada Jr. says he was looking for when he found MessageClick two



**TOM O'KEEFE** and more than 100 of his key employees at Tulley's Coffee reap the benefits of having an ASP take care of the company's voice communications

months ago. "We have [mortgage] closings happening every hour," says Pada, vice president of 1st 2nd Mortgage Company of N.J. Inc. in Cresskill, N.J. Clients, real estate brokers and attorneys need to communicate with one another in real time, he says.

When there's a last-minute question before or at a closing, voice mail simply doesn't work, Pada explains. Each of 30 customer agents at Pada's mortgage firm has a phone number assigned by MessageClick. The numbers are toll free. Users can instruct MessageClick on routing incoming calls.

Another MessageClick service that Pada says he likes is text-to-voice conversion. This system automatically converts e-mail messages to voice files, allowing Pada to listen to a computer-synthesized voice read e-mail text over the phone. Although the voice sounds too much like a computer, Pada says, he's satisfied that the software agent doing the virtual reading correctly pronounces 90% to 95% of the words. The agent spells out words and acronyms it can't pronounce, he says.

The cost of using an outsourcer varies according to the number of employees who use the communications services, combined with the level of services they use. For example, O'Keefe says he pays \$16 per month for each of the 110 employees who have AccessLine numbers. Meanwhile, Pada pays about \$8 per month per user for the 30 employees who use MessageClick services.

These costs can mount, especially at

large companies like PeopleSoft Inc. in Pleasanton, Calif., where Engineering Vice President Neil Hennessy says he pays \$10 per month for each of the 400 salespeople who now use AccessLine. Hennessy says his costs may rise because he may add 1,600 more users in the future.

Nonetheless, O'Keefe says he's convinced that outsourced voice communications offer a viable alternative, both in cost and functionality, to PBX systems that require maintenance and upgrades and that may need to be replaced to keep up with the needs of the business.

Pada says voice messaging functionality, such as having a mortgage loan specialist on duty 24 hours a day, is invaluable. "In today's market, everyone has the same interest rate," he says. "What [voice outsourcing] does is make us a better service company."

**“**

What [voice outsourcing] does is make us a better service company.

**ANDY PADA JR., VICE PRESIDENT,  
1ST 2ND MORTGAGE CO.**

# Call Here, Ring There

Companies look beyond the PBX for extended voice communications services.

By James Cope

**T**HE ROAD FROM paper to virtual money has been blocked at every turn by cultural and technological barriers. But a new spirit of both cooperation and competition between fast young start-ups and traditional financial institutions is beginning to push some of these barriers aside.

Within five years, the vast majority of business-to-business transactions is expected to be electronic, analysts say, leading to faster payments, lower costs and, potentially, less fraud as stringent identity authentication and credit risk-assessment procedures become easier and less expensive.

These savings, combined with faster collections, integration with back-end procurement and financial systems, and access to a larger supplier and customer base, could expand the U.S. economic boom to the rest of the world, analysts say.

"Money is always in search of the place where it gets the best return," says Thornton May, until recently a futurist at Cambridge Technology Partners Inc. in Cambridge, Mass., and an occasional *Computerworld* columnist.

The increased access to market information made possible by the Internet, along with the ease of making electronic payments, will make it possible for companies to change suppliers or distributors in real time on a global scale.

"You will be able to exit bad resource allocations more quickly, which is really what's driving much of the New Economy right now," he says. "It's almost real-time feedback: That didn't work; stop; try again."

#### Security Barriers

While virtual transactions are gaining steam, the vast majority of payments are still made with checks.

According to Stamford, Conn.-based Gartner Group Inc., 14% of business-to-business payments are made electronically. But that figure is expected to grow to 50% by 2009, says Gartner analyst Avivah Litan.

The biggest reason for the resistance to virtual payments is security, according to May. Companies, particularly those making large transactions, are concerned about the integrity of financial information that travels over the Internet, he says.

"Companies are going to spend more on digital security [than Y2k]," says May. "Probably one and a half times more."

The threat isn't only from hackers breaking into sensitive systems. Fraud is also a possibility: Persons or companies passing themselves off as someone or something else.

"There's very little done now to validate the identity of the person making an inquiry," says Elizabeth Achorn, an analyst at Newton, Mass.-based Meridian Research Inc.

But both banks and start-ups are beginning to address the problem. Digital Signature Trust Co., a subsidiary of Salt Lake City-based Zions Bancorp., serves as a digital signature clearinghouse for banks. Other companies, including start-ups like Mountain View, Calif.-based VeriSign Inc. and major credit-card companies, also offer online identity verification and digital certificates. And the American Bankers Association recently initiated its own digital signature program, called TrustID.

But the process of using a digital certificate is still cumbersome and unattractive to consumers, says Litan. Businesses are more likely than individuals to use digital signatures, she says, because they have more to lose from fraud.

#### Open-Door Exchanges

Large corporations have been exchanging money electronically for decades with costly and complicated electronic data interchange (EDI) systems.

These systems carry not only financial transaction information, but also detailed data about the status of orders.

The advent of XML has recently allowed Web-based front ends to be in-

stalled on these systems, letting small suppliers compete on a more equal footing with the major players.

"The big buyers and big sellers want [smaller companies] to participate without having to send a paper purchase order," says Kevin Jones, an analyst at Jupiter Communications Inc.

American Express Co. recently invested in start-up EC Co. in Palo Alto, Calif., which uses the Internet to integrate off-the-shelf small business accounting tools such as Intuit Inc.'s QuickBooks with the heavy-duty EDI systems used by large corporations.

"These guys reach people who are hard to reach and bring them online," Jones says, adding that American Express also benefits from bringing small companies that use its credit card into EDI exchanges.

The Internet has brought about a new alternative to the EDI-based supply chain — the online business-to-business exchange.

By 2003, one-quarter of business-to-business purchases will be made online, according to The Boston Consulting Group. That growth is expected to flourish most via digital marketplaces, such as VerticalNet Inc., Chemdex Corp. and e-Steel Corp.

Gartner Group expects the number of online business-to-business exchanges to climb from current estimates of 1,350 to about 3,000 by 2002.

These exchanges — powered by companies such as Pleasanton, Calif.-based Commerce One Inc., Mountain View, Calif.-based Ariba Inc. and New York-based TradeWeb LLC — offer small and large businesses an opportunity to find one another.

Until recently, however, financial arrangements were an afterthought, with companies left on their own as far as payments were concerned.

But after a number of third-party financial service providers sprang in to close the gaps by providing online authentication and payment services, large banks also began to move into this potentially very lucrative sector.

"Citibank is in partnership with Commerce One; Bank of America is partnering with Ariba," says Meredith Hickman, an analyst at Cambridge, Mass.-based Celent Communications. "There are several partnerships forming out there. It's definitely a hot area, but right now we're still in the very early stages."

#### Banks Play Catch Up

North American banks spent a total of about \$90 million on Internet corporate-banking applications last year, according to Needham, Mass.-based TowerGroup. That was a drop in the bucket compared with their other expenditures. According to Securities and Exchange Commission filings, Citibank

# The Speeded Money



alone spent \$527 million running e-Citi, its Internet site for consumers in 1999.

But banks are expected to start to put more money into business-related Internet projects.

Investments in Internet-related corporate banking applications are expected to increase by 34% annually to reach \$290 million in 2003, with huge outlays expected for both self-developed systems and acquired technology, according to TowerGroup analyst Rajeev Agarwal.

Just last week, Citigroup and Wells Fargo & Co. announced a partnership with three technology companies — Enron Broadband Services Inc. in Portland, Ore., i2 Technologies Inc. in Dallas and financial services software provider SI Corp. in Atlanta — to create FinancialSettlementMatrix.com, a venture that will link buyers and sellers in electronic marketplaces with payment processing, credit and other services through participating banks.

"In our view, it's going to be important that the financial institutions don't see themselves as competitors, but co-facilitators," says Steve Ellis, executive vice president of Wells Fargo's Wholesale Internet Solutions Group. "We're working on combining an infrastructure so we can hook to an exchange, and the exchange can hook with a variety of other financial institutions."

To make inroads in business-to-busi-

ness e-commerce, many banks will "have to build the infrastructure first," Agarwal says. That could be expensive.

The Bank of New York Co. is in the process of rebuilding its global communication networks using Internet standards so as to enable corporate customers to move money quickly and easily around the planet.

This network is key to the bank's global success, says James King, vice president of international communications at The Bank of New York. As a result of its investment — which King refuses to quantify — the bank already handles back-office systems (that is, it keeps track of the money) for a number of Wall Street firms, including J. P. Morgan & Co.

Outsourcing those tasks to The Bank of New York saved J. P. Morgan the expense of having to invest in its own technology, says Chief Technology Officer Veronique Weill.

In effect, The Bank of New York reinvented itself as a tech-savvy service provider.

"For many, many years, we were a very conservatively oriented bank," King says. "It didn't burst forth with any new technology applications. The con-

servatism kept us at bay. But we now have a very young and aggressive technology staff at the helm, developed over the last four or five years."

#### Race May Go to the Swift

With the ever-increasing rate of technological change, many question whether banks will be able to keep up the pace.

One of the doomsayers is recently retired Citigroup Chairman John Reed, who has been responsible for many of the bank's technological innovations.

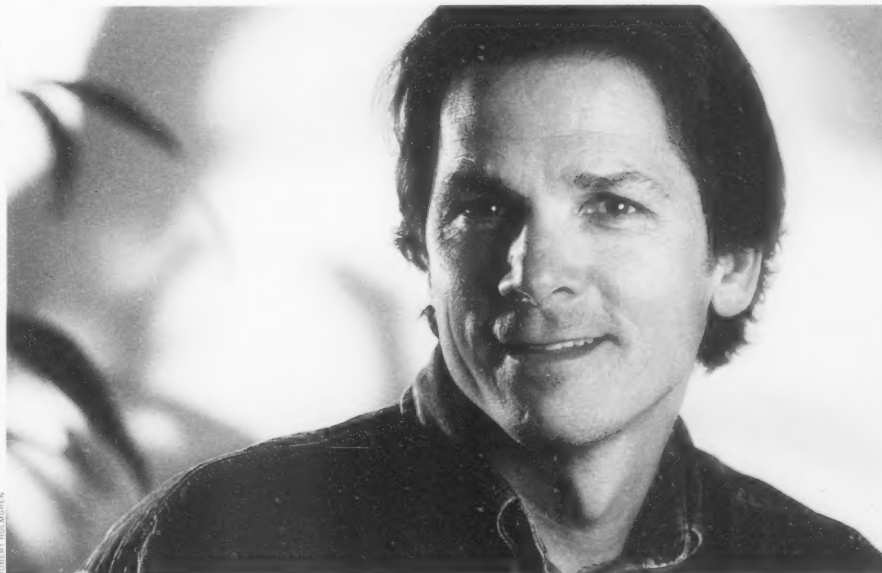
"I believe that the advantage in this change lies with those who come from the future rather than those who come from the past," Reed told a recent meeting of financial industry executives in New York.

In particular, he stressed, money transfer is an area susceptible to "major revolution," and traditional banks aren't well placed to survive.

"It's very hard to move faster than the generations move," he said. "You're going to have to wait until you have people who are relatively young and relatively capable in this medium in positions where they can make things happen." ■

It's going to be important that the financial institutions don't see themselves as competitors, but co-facilitators.

STEVE ELLIS, EXECUTIVE VICE PRESIDENT,  
WHOLESALE INTERNET SOLUTIONS GROUP,  
WELLS FARGO



The Internet is bringing about massive changes in the way capital flows, which could translate into an economic boom of global proportions. By Maria Trombly

of  
ey



# WELL-WIRED SUMMER CAMPERS

Computer camps for teens aren't new. What is new is the merging of technology and business issues in the curriculum. *Computerworld* spent some time this summer with students at Bentley College's 'Get Wired, Get Hired' program to find out what this trend might mean for future IT workers. By Erik Sherman

**W**HEN KATIE ROWE, a high school student from Burlington, Mass., arrived at Bentley College in the nearby town of Waltham last month, she thought she'd be attending a figure-skating camp.

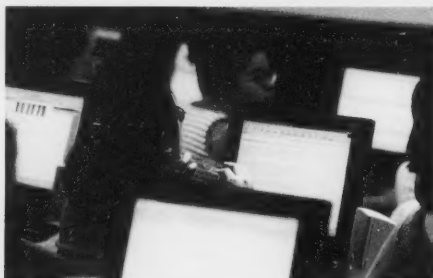
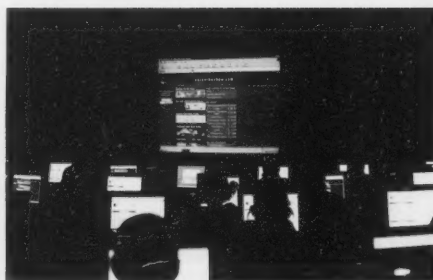
Instead, she's sitting in a lecture room, a computer in front of her, playing solitaire while listening to other teens toss out Boston trivia questions that they researched on the Internet. Between the voices and the different music tracks pouring out of computer speakers around the room, it's a noisy place. "I have a wicked headache," says Rowe. But she continues to follow the discussion.

Call it a technological kidnapping. Rowe's parents tricked her into coming to "Get Wired, Get Hired," a new, one-week camp offered by Bentley, a college for business students, to educate young women about how business and technology interact.

The school started the program after it noticed that women are often underrepresented in business and technology. In fact, only 41% of Bentley's undergraduate population is female. The program's founders hope to encourage young women entering their sophomore or junior years of high school to consider careers in those areas by showing how technology and business can work hand in hand in a fun way.

As far as school officials know, this is the first such program in the country. If combined business and technology programs become a trend, information technology organizations may lose some technically adept individuals to other areas of business. At the same time, the good news is that future corporate end users may be better trained in — and more appreciative of — technology.

Making the interaction of technology and business seem fun may be just the trick to attracting more people to those fields. Although Rowe rather unexpectedly found herself among 34 attendees whose parents paid \$275 for the program, she did end up enjoying herself, she says.



"It worked," Rowe says of her parents' ruse. It was crucial that she enjoyed the experience, she says, because she's uncomfortable with computers. "I'm not really good at them," Rowe explains. And yet the young woman found herself easily conducting research on the Internet.

Something IT departments could benefit from is Bentley's focus on business issues while presenting technology as a set of tools to help reduce the campers' computer anxiety. College faculty and guest speakers taught courses about making oral presentations, applying the Web to business research, creating documents, burning CDs and even videoconferencing.

Rowe says she found herself at ease in the setting. "It's not just a computer camp," she says.

#### Addressing Diverse Interests

Counter to the image that the words *computer camp* might conjure, the teens came to Bentley with a wide range of exposure to technology and an equally diverse set of interests.

"They might have tried to surf the Web here and there," says Issa Beltran, Bentley's director of pre-collegiate outreach. Some of the young women had used PCs only as word processors in the past, while others were more practiced at using technology. "They're more comfortable with the Web but want to be able to use information technology as it relates to business in this day and age," explains Beltran.

One attendee further along the learning curve is Sailaga Ganti of Attleboro, Mass., who is entering her senior year of high school. "I'm learning C++ this year in my school," says Ganti, who has also learned to use PowerPoint, Visual Basic and Excel. "All of those are standard in my school."

Last year, Ganti says, she came to the leadership camp and liked it, which prompted her to return. Of course, having two parents who work in the computer industry helps. "I know I'm going to end up working in computers," Ganti adds. Beyond bringing technical skills to an employer, however, she'll have a

**"I think it helps for girls that want to learn more about every different part of business. I think it also provides a lot more confidence. It's not always cool to say, 'I want to go into business.' But here, everybody's into it."**

BECCA SIMONS, STUDENT,  
WELLESLEY, MASS.

sensitivity to business issues that's becoming a critical skill in IT departments.

"I'm interested in technology, and I know there are going to be a lot of computers in the future," says Valerie Vancollie, a Belgium native whose family moved to Acton, Mass., three years ago. "I was hoping to improve my [computer] skills."

Like many of the students, Vancollie may not have a career in IT in the future — her current passion is writing — but she'll bring a positive attitude toward technology, no matter what type of work she chooses.

Showing interest in the camp wasn't easy for some of the young women because of peer pressure. "I got a lot of grief from my friends," reports Emily Fowler, who is entering her second year of high school in Sudbury, Mass., and wants to be a doctor. "They'd

say, 'Oh, you're going to a computer camp,' and I'd say, 'No, it's a business camp.'"

Such negative stereotypes can drive some young women away from technology-related careers or even from embracing the use of computers. But those who get into "Get Wired, Get Hired" may find a haven from the tempest of teen-age disapproval.

#### Getting With the Program

"I think it helps for girls that want to learn more about every different part of business," says Becca Simons, who's entering her junior year of high school in Wellesley, Mass. "I think it also provides a lot more confidence. It's not always cool to say, 'I want to go into business.' But here, everybody's into it."

Simons hopes that having a background in computers will help her in the restaurant industry. "With the business and financial things that go along with [restaurants], you definitely need to know how to use the computer," says Simons. She says she hopes to have her own restaurant one day.

Much of the camp's learning was presented in a fun setting, which the teens acknowledge can be helpful. But even free time often centered on using the computers. "When I came back from lunch, people were in here downloading music, listening to it, checking e-mail, [participating in] online chats," says Vancollie.

But not everything went smoothly. Some campers found the classroom sessions too long. "For this whole week, we've been [in a classroom each day] for three consecutive hours," says Fowler. "I came to this camp so I could listen to these wonderful presentations, and when I lose my concentration, I feel like I'm wasting their time and mine."

Given that it's the first year of the program, Fowler says, she hopes such rough edges will be smoothed out — perhaps in time for the approximately 75 teens Bentley plans to attract next summer. ▀

Sherman is a freelance writer in Marshfield, Mass.



AT CAMP BENTLEY last month, the college aimed to introduce young women to technology and business in a fun atmosphere



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# Management Service Providers

BY MARK HALL

**Y**OUR MAINFRAME is humming along, but to be safe, you glance at key metrics in systems management packages such as Computer Associates International Inc.'s Unicenter suite. Your array of Sun Solaris and HP-UX database servers also appears to be operating normally, but you make sure by studying the servers' status on your Tivoli Systems Inc. management station.

But when you wander past your Web servers, you probably look heavenward and hope for the best.

Web application and infrastructure monitoring and management have suddenly become critical, yet the tools to do them are lacking. Management service providers (MSP), the latest addition to the current slew of service providers, claim to offer products and services that will oversee your Web operations.

Companies staking claims as early MSPs include Candle Corp. in Santa Monica, Calif.; InteQ Corp. in Burlington, Mass.; and Nuclio Corp. in Skokie, Ill.

## Features

What makes MSPs distinctive is that their products and services are provided over the Internet on a subscription basis. That means "MSPs can achieve economies of scale that companies who license software cannot," says Christopher Booth, head of technical operations at FreightWise Inc., a Fort Worth, Texas-based online transportation exchange.

Though he declined to say how much his company is paying to use Nuclio's MSP, Booth did say that the service

**DEFINITION**  
**Management service providers** are companies that sell subscription services to manage information technology infrastructure and applications over the Internet.

has been "very advantageous."

The cost savings that MSPs can pass on may help them catch on with corporate customers. Gartner Group Inc. in Stamford, Conn., estimates that the \$90 million MSP market will balloon to more than \$3.25 billion by 2005.

## Think Big

"MSPs resonate with folks in large companies who don't have the time or inclination to oversee their Web infrastructure," according to David Hybels, an analyst at Extraprise Inc. in Boston. "Fortune 1,000 companies are going to grab [MSPs] because of the resource shortage."

Roger Smith, director of information systems at Manufacturers' Services Ltd. (MSL) in Concord, Mass., agrees. Smith says the \$1 billion electronics manufacturer studied whether it should manage its global Web operations itself or hire an MSP.

"We would have needed a lot in terms of infrastructure investment to do the job," Smith says. Instead, the company picked InteQ earlier this year to manage its Web sites around the clock.

Smith says he expects InteQ's services to improve performance and uptime, which is critical for MSL's corporate customers, who use its online sites at all hours.

Smith says that because he runs a lean staff, he's depending on his MSP to monitor server loads, network capacity, application availability and a variety of other system and network parameters.

Thinking about local service for his global Web operation contributed to his choice, Smith says. "We looked at West

Coast vendors, but the distance was a problem. I want to have monthly get-togethers between my technical staff and my MSP," he says.

## Control vs. Competence

Stan Schott says he doesn't think it's worthwhile to train information technology staffers to troubleshoot all Web site problems. Schott, an analyst at Cambridge, Mass.-based Giga Information Group Inc., points to a function such as Web server-load testing as an ideal area to outsource to an MSP because "it's not something you do every day," he says.

Schott says IT managers can waste a lot of time and money by training staff on arcane and rarely used monitoring and management tools. Depending on in-house knowledge of such tools can be risky, especially in an era of high employee turnover, he adds.

Picking an MSP can also

be risky. Schott and others say they expect a wave of consolidation to eventually sweep through the MSP ranks, so the company you partner with now may not be around in a few years — or even in a few months, for that matter. That's why it's advisable to negotiate as short a contract as possible with an MSP, observers say.

## Getting Together

Meanwhile, several MSPs have banded together to form the MSP Association in Wakefield, Mass. The group met for the first time last month to choose officers and identify com-



**MSPs can achieve economies of scale that companies who license software cannot.**

CHRISTOPHER BOOTH, HEAD OF TECHNICAL OPERATIONS, FREIGHTWISE INC.

mittees for areas such as customer education and developing best practices.

Although Schott says he questions whether vendors are objective enough to agree on common best practices because of their product bias, he says he sees the MSP Association as a way to bring credibility to management services as a whole. He adds that the group could turn out to be just the right forum to take MSPs beyond Web site management and into enterprise infrastructure oversight.

InteQ President and Chief Technology Officer Yash Shah says that MSPs now manage the entire IT infrastructure for small and midsize businesses, and large enterprises aren't far behind. ▀

**User Expectations Create IT Challenges**

Having a Web site with complex, changing requirements — such as tracking every Web page load time and uptime. Management service providers claim to be able to help IT departments manage quality and security of their Web environment.

| ATTRIBUTE           | CHALLENGE  |
|---------------------|--|
| <b>Availability</b> | Preventing downtime to create a business that runs around the clock                        |
| <b>Performance</b>  | Minimizing load time to avoid losing customers   |
| <b>Reliability</b>  | Ensuring integrity to protect the company's reputation                                     |
| <b>Scalability</b>  | Growing with the company while sustaining peak performance                                 |
| <b>Security</b>     | Protecting Web site and user data without degrading performance or overall user experience |

SOURCE: EXTRAPRISE INC.



## Dear Career Adviser:

*My 26-year-old co-worker and I are local government employees for an isolated rural community. Promoted after two and a half years as a PC technician, he is the network administrator. He has a bachelor's degree in physics, aced his Certified Cisco Network Administrator*

*after two weeks' study and loves Linux.*

*He built our network firewall, and he designed and is now installing the new LAN/WAN. His experience includes site wiring, fiber-optic cabling and testing, private branch exchange programming and AS/400 operations, configurations and communications.*

*My co-worker wants to return home to Colorado, but a Denver headhunter told him that "government experience is worse than none at all." I'm worried, too, after being here for six-plus years. Are we trapped? — READY2GO*

### Dear Ready:

While Colorado is known for premium beef, that recruiter gave you a bum steer. In fact, says Carla Henebrey, CEO of the Association of Information Technology Professionals (AITP) in Denver, both of you have skills that are perfect for Denver.

It's a job market that sports well-established telecommunications and cable compa-

nies, is home to Qwest Communications International Inc. and US West Inc., has a large federal government presence and hosts many new electronic businesses and four incubators.

Because Colorado recently launched an initiative to rebrand itself as the "convergence corridor," Denver electronic-business consultant Ty Bohannon advises, "Ready's first job-hunt move should include contacting Denver's Internet Chamber of Commerce [www.icc.org] and the Colorado Software Association [www.colosoft.org]."

There's a comprehensive list of Colorado technical societies and user groups at [www.ctm.org/colorado/colouser.htm](http://www.ctm.org/colorado/colouser.htm). Coincidentally, you can get set to go by attending Denver's AITP September meeting, which focuses specifically on Linux ([www.denveraitp.org/home.htm.dinner](http://www.denveraitp.org/home.htm.dinner)).

### Dear Career Adviser:

*A few months ago, you discussed technical recruiting as a*

*good career choice. Given the times, can I still make a good living as a recruiter?*

— OPPORTUNITY KNOCKS

### Dear Knocks:

It's true. The market for recruiters is a lot more challenging than it once was.

Companies and recruiters alike are complaining that since April, finding interested and qualified candidates is more difficult and the due diligence candidates perform before moving has reached new highs.

Should you still want to recruit, find a firm that focuses on a specific leading-edge technology and marketplace, whether it's hardware, software, Internet infrastructure or communications technologies.

Pick a firm with a known reputation — one that has built and maintained a database of candidates in a specialized field and that deals with excellent companies.

Within the recruiting firm, find an excellent mentor and hone your research skills. You

will need to effectively articulate your client company's story to candidates, who will be besieged by choices.

### Dear Career Adviser:

*I'm an information technology consultant specializing in designing and developing business systems using such tools as Visual Basic, PowerBuilder, Access, C, SQL, PL-SQL with Oracle and various other relational database management systems.*

*I'm very well-paid, but I've noticed that Java and electronic developers are earning more.*

*I have a solid technical background and can adapt to new tools and technologies fairly quickly. But switching to a different platform means opting for a substantial salary cut and an uncertain future.*

*My choices: hard work, sticking with my current skills or going for a master's degree or a management job. — CHOICES, CHOICES*

### Dear Choices:

On the surface, your background makes you more valuable than a pure Web/Java developer because of your experience with full life-cycle development projects and your ability to solve problems, according to Steve Hagarty, account manager at

Brainpower, a San Francisco-based contract consulting company.

"Technology like Java and XML are just tools to solve your client's problems and deliver a product," he says.

To expand your knowledge, you should go after an actual Web project to gain skills in new areas.

In other words, use the project to learn on the job, which is what most contractors do. You could start out by doing SQL database development and eventually get involved in

graphical user interface (GUI) development using Java and become a consultant who can do both back-end and front-end work.

"In this job market, a contractor with over 10 years' GUI/database experience with one year in Web development is more highly valued than

are Web developers with under five years' experience," says Hagarty.

In fact, a Visual Basic or SQL developer who earned \$65 to \$80 per hour last year could now earn \$80 to \$100 per hour doing Java, XML, HTML and SQL work.

If you decide to stop traveling and opt for employee status, a management degree would open other opportunities. But watch out. After a few years as a manager, returning to a purely technical role could be problematic. ■



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at [www.computerworld.com/career\\_advisor](http://www.computerworld.com/career_advisor).

## BRIEFS

### Firms to Integrate XML, EDI Transactions

Philadelphia-based Bluestone Software Inc.'s business-to-business transaction server will be integrated with McLean, Va.-based XML Solutions Corp.'s electronic data interchange (EDI) and XML translation and schema management software. The integration will help firms exchange data between EDI- and XML-based systems, the companies said last week. The Bluestone/XML Solutions offering is expected in the fourth quarter.

### SAIC Partners With Sagent Technology

Mountain View, Calif.-based Sagent Technology Inc. last week announced a partnership with Science Applications International Corp. (SAIC), a San Diego-based systems integrator. SAIC will use Sagent's Web-based analytic applications in its business intelligence integration projects.

### Oracle Users Group Gets New President

The Chicago-based International Oracle Users Group-Americas (IOUG-A) tapped Richard J. Niemiec

as its new president. Niemiec is CEO and co-founder of The Ultimate Software Consultants in Lombard, Ill., and has been vice president of IOUG-A for the past two years. The organization provides a forum for Oracle vendors and customers and has more than 10,000 members worldwide.

### BroadVision Forges Commerce One Deal

BroadVision Inc.'s Procurement application will be integrated with Commerce One Inc.'s online marketplace, MarketSite.net, the companies announced last week.

Under the agreement, Redwood

City, Calif.-based BroadVision's Procurement customers will be offered access to Pleasanton, Calif.-based Commerce One's business-to-business portal for buying and selling goods and services.

### Secant Technologies Names Holt President

Secant Technologies Inc., a Cleveland-based application server vendor, last week announced that Jim Holt has been named president. Holt most recently served as a senior vice president and general manager at Islandia, N.Y.-based Computer Associates International

Inc. after it acquired e-commerce and networking consultancy Realogic Inc. in 1998.

### Energy Exchange Gets OK from FTC, EU

Houston-based Trade-Ranger Inc., an Internet marketplace founded by 14 energy and petrochemical companies, announced that it has completed the regulatory procedures required by the mergers task force run by the Federal Trade Commission and the European Union. It has also completed its first round of funding. The companies expect to begin trading on Trade-Ranger next month.

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# TECHNOLOGY

## DATA FERRETS

With structured data and document files scattered all over their systems, enterprises look for a better and easier way to search, find and mine content. **52**

## TOTAL TRADING

B2B exchange managers grappling with trading environments from back to front office, along the supply chain and across partners could find relief, say experts — if BMC Software delivers on its end-to-end management promises. **52**

## INTEGRATOR ACCELERATOR?

Candle Corp. says an updated version of its monitoring tool for IBM's newly icon-driven MQSeries Integrator Version 2.0 will make integrating and monitoring applications easier and faster. **54**

## SECURITY JOURNAL

Security manager "Jude Thaddeus" ponders how far he should go to stop potential hacker attacks. Do the risks and potential costs of an attack warrant extreme measures, or is the threat of an attack perhaps a bit overhyped? **56**

## QUICKSTUDY

As electronic transactions proliferate, there's an increasing need for third-party verification and authentication in the form of digital certificates, which are data

files used to establish the identities of people and electronic assets on the Internet. **58**

## FUTURE WATCH

Natural and social scientists are using an experimental program called Swarm to model a changing world. The software has applications in fields from biology to economics. **59**

## BALANCING ACT

Waiting for Web servers to respond doesn't make for happy customers. So companies are turning to sophisticated load balancing, spreading Web traffic over multiple servers and even routing traffic based on the application that's using it. **60**

## WEB SITE MAKEOVER

Online brokerage Ameritrade simply couldn't afford Web downtime. To improve the reliability of its site, it conducted more predictive testing, did a more rigorous job of tweaking software to run on advanced hardware and created a separate testing group with more clout in the organization. **62**

## EMERGING COMPANIES

Start-up OrderFusion is counting on the success of its software suite, Order of Magnitude, which users have applauded for its ease of use. But it's uncertain whether OrderFusion can differentiate itself from its competitors. **66**



ED GABRYS, senior systems security specialist at People's Bank, aced the CISSP exam, which he says helped him get the position he wanted

## SECURE WITH SECURITY PROS

COMPANIES ARE DESPERATE to hire — or create — skilled security professionals such as Ed Gabrys (above). As a result, a number of new certifications are emerging for security technologies and job roles, from security generalists to specialists. We take a look at the top certification program and what it means for your career.

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# Companies Seek Tools to Ferret Out Scattered Data

*Start-up NextPage offering XML-enabled tool to search content across many servers*

BY JAMES COPE

**A**S COMPANIES add bigger hard drives and place servers for different departments in different locations, information technology managers are looking for ways to make the content that hardware contains searchable and easy to display on user desktops.

The challenge, say some corporate users, is finding one way to access both content located in the labeled fields of structured databases in central repositories and data that's stored as documents across hundreds of servers.

Paul Rolich, the multimedia manager at The National Underwriter Co. in Erlanger, Ky., said that several months ago, he was about ready to write his own XML code to create a con-

tent indexing and management system, when he came across NextPage LLC, a start-up firm in Provo, Utah.

XML lets users write tags that describe data, making it possible to display and manipulate virtually any type of information on a Web page.

NextPage was formed in July of last year when a group of

investors purchased the Folio content management technology from Open Market Inc. in Burlington, Mass., according to a company spokesman.

## Electronic Paper Trail

Rolich uses NextPage's software to index and manage individual and sets of documents that insurance companies use for reference. His department converted thousands of paper documents that were created and changed each month to an HTML format, which employs

the predefined headings used to build Web pages that can be read with a browser, he said.

The documents were then "sucked into the NextPage server," Rolich said, and published to The National Underwriter's intranet as HTML pages.

Rolich said insurance companies that purchase the documents his company publishes could search the NextPage index of those documents from a Web browser and display the document that meets the search criteria. Insurance company customers could in turn distribute the same documents out of The National Underwriter's database to insurance wholesalers and retail agents.

Mike Maziarka, an analyst at CAP Ventures Inc. in Norwell, Mass., said NextPage's technology is based on Folio but the company has added new components using XML.

The Folio products, Maziarka said, focused on publishing searchable databases of documents on CD-ROMs. He said

NextPage has taken the concept of syndication — the ability to either distribute or receive content from different sources — and applied it to the enterprise.

He acknowledged that NextPage's early adopters like The National Underwriter and another user, Thomson Learning in Stamford, Conn., are mostly in publishing-related businesses, which he said was a function of NextPage's Folio roots.

## Challenges Ahead

Before NextPage considers markets other than publishing, it may have to make an effort to mend relationships with old Folio customers, said Andy Warzecha, an analyst at Meta Group Inc. in Stamford, Conn. "Open Market killed credibility for Folio users [when Open Market owned Folio]," Warzecha said.

Josh Walker, an analyst at Forrester Research Inc. in Cambridge, Mass., said that what NextPage is doing is part of a larger and growing trend and that the idea isn't particularly new. Other companies, such as Brio Technology Inc. in Santa Clara, Calif., and Hummingbird Ltd. in New York, Ontario, are aggressively pursuing the same markets and have competing technologies. ▀



PAUL ROLICH and his staff at The National Underwriter converted reams of documents to HTML pages using NextPage's indexing tool

## BMC's Patrol Targets B2B Management

*Promises exchanges a unified approach*

BY SAM LAIS

Business-to-business exchange managers who are grappling with trading environments that stretch from the back office to the front office, along the supply chain and across trading partners could soon find their management tasks easier, according to industry experts. That's if BMC Software Inc. delivers on the end-to-end management promises it made last week.

On Aug. 1, Houston-based BMC issued a road map of product releases it has planned through the first quarter of next year. Built on its Patrol performance management software, the products will let information technology man-

agers tie front office and trading exchange environments to back office and Web applications for single-point management, a BMC spokesman said.

"What BMC is doing is the same block-and-tackle management in the online B2B environment that it's done in database and application management," said Raymond Paquet, an analyst at Gartner Group Inc. in Stamford, Conn. "They're building knowledge modules for Patrol that extend the management reach."

The knowledge modules planned for the new products are small pieces of code unique to each section of software in the chain, said David Anderson, an IT manager at Atlanta-based global travel reservations distributor Worldspan Inc. The software agents for each module report data back to the Patrol enterprise man-

agement software, he said.

Worldspan uses BMC software to manage transactions from start to finish, but it was no small task to integrate data from all the company's management tools into a single BMC display, Anderson said. "What the new products would do is make that integration much simpler," he said.

"All that exists today is islands of management," said Donna Scott, an analyst at Gartner Group. "Nothing out there does the whole job from end to end, including, as of yet, BMC."

"We're looking right now for something that would do that," said Fletcher Cocquyt, a senior Unix systems administrator at business-to-business travel exchange GetThere Inc. in Menlo Park, Calif. "We have a lot of disparate databases and applications that we have to integrate and then watch."

That scenario is business as usual, according to Paquet. "An installed base must exist before vendors build software to manage it," he said.

With the business-to-business exchange market likely to hit \$10 trillion by 2002, according to a report from eMarketer Inc. in New York, the installed base is there. BMC should anticipate competition from firms such as Computer Associates International Inc. in Islandia,

N.Y.; NetIQ Corp. in Santa Clara, Calif.; Tivoli Systems Inc. in Austin, Texas; and Hewlett-Packard Co., Scott said.

Patrol modules due out this year will target customer relationship management software from Siebel Systems Inc. in San Mateo, Calif.; supply-chain planning software from i2 Technologies Inc. in Dallas; and Operating Resource Management System from Ariba Inc. in Mountain View, Calif. ▀

## BMC Software Patrol Plug-ins

### Coming this year for:

- Siebel Systems' customer relationship management software
- i2 Technologies' supply-chain planning software
- Ariba's Operating Resource Management System

### Coming in next year's first quarter for:

- Commerce One Inc.'s portal-building software
- BroadVision Inc.'s electronic-business application development software
- SAP AG's MySAP.com business application hosting service
- IBM's WebSphere e-commerce application development server
- BEA Systems Inc.'s Java-based WebLogic electronic-business application server
- Microsoft Corp.'s BizTalk 2000 XML-based application development server and Commerce 2000 Server e-commerce platform

# It's Not Just a Dot.Com World

Silicon Valley



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## Candle Readies MQSI 2.0 Management Package

BY SAMI LAIS

According to Candle Corp., an updated version of its monitoring tool for IBM's newly icon-driven MQSeries Integra-

tor (MQSI) 2.0 will make integrating and monitoring applications easier and faster.

MQSeries is messaging middleware

that makes data and applications on one platform available to those of another. "It's the basis for enterprise application integration," said Susan Eustis, president of WinterGreen Research Inc. in Lexington, Mass.

MQSI lets information technology managers integrate applications in an MQSeries environment. Version 2.0, released this spring, offers drag-and-drop, icon-driven application integration and support for XML, along with proprietary databases and applications.

At The Prudential Insurance Company of America in Roseland, N.J., MQSeries manager Tim Halbur said he's eager to beta-test Candle Command Center (CCC) for MQSI 2.0. Prudential business units had little interest in MQSI 1.1, Halbur said.

"The difference between MQSI 1.1 and 2.0 is night and day," he said. Halbur said he has plans for two CCC for MQSI 2.0 pilots.

For Prudential's financial management division, the application will provide price quotes, he said. For the insurance division, a pilot application will give brokers access to data in all of Prudential's legacy systems.

With MQSI 2.0, "if you have an application you need, you can slap a pretty face in Java or whatever on the front end and give the user access to all your legacy data, whether it's mainframe or AIX or NT or whatever," Halbur said.

### Customization on Wish List

On Halbur's wish list: Greater ability to customize what he monitors for his application owners, because "everyone wants to measure something different," he said. But "Candle has some ideas there," and Prudential has a history with the company, he said.

When Prudential first implemented MQSeries in 1996, "we knew we needed

**MQSeries  
Integrator for  
handhelds will  
open systems up  
and make them  
available anywhere.  
The phones are  
ringing off the  
hook for this one.**

SUSAN EUSTIS, PRESIDENT,  
WINTERGREEN RESEARCH INC.

to monitor it," Halbur said. He evaluated several tools and did trial runs of Tivoli Systems Inc.'s TME 10 for MQSeries and the CCC for MQSeries management package.

A combination of ease of use and out-of-band, or non-MQSeries, messaging for reporting and monitoring data tipped the scales in favor of the Candle product, Halbur said.

Eustis called CCC for MQSI 2.0 "a strong tool, as are all of Candle's MQSeries tools." Although other good tools exist, of the \$67 million MQSeries management software market last year, El Segundo, Calif.-based Candle held 57%, Tivoli had 28% and BMC Software Inc. held 8%, she said. "MQSeries Integrator for handhelds will open systems up and make them available anywhere. The phones are ringing off the hook for this one," Eustis said.

CCC for MQSI 2.0 will be available in November and cost \$22,000 per MQSI server, a Candle spokeswoman said. ▀

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## Microsoft Posts .Net Kit Online

BY LEE COPELAND

Giving developers a small taste of its .Net framework, Microsoft Corp. last week posted an early technology preview of the new code on the Web.

Microsoft originally released the Technology Preview Software Development Kit (SDK) at its Professional Developers Conference in Orlando last month.

The SDK now is generally available at <http://msdn.microsoft.com/net>.

Microsoft touts the .Net framework as a means for creating applications that act as Web services that can be ex-

changed with other applications running on different operating system environments via the Web.

Microsoft said it expects to deliver the full .Net framework within the next two years.

The .Net SDK includes tools for building and testing .Net applications, such as the Common Language Runtime, Active Server Pages+ (ASP+) and code samples.

The Common Language Runtime is an important component of the .Net environment because it enables Microsoft's new object-oriented development language, C# (pronounced C sharp), to be executed on the .Net code platform.

Company officials said the newly revamped ASP+ simplifies code development by eliminating spaghetti code and Dynamic Link Library component registration. ▀

## Tool Enables Data Visualization and Trend Analysis

BY LEE COPELAND

Spotfire Inc.'s decision-analysis tool allows users to collect statistical data and perform decision analysis via the Web. The latest version, Spotfire.net 5.0, features enhanced data-visualization capabilities that will aid users in visually detecting data trends and anomalies, company officials said.

Released last month by the Cambridge, Mass.-based firm, Spotfire.net 5.0 includes support for XML, which allows data files to be read and incorporated into other applications. The application also includes enhanced data-visualization tools, including some that support data plotting and as many as 1 million records.

Greg Tucker-Kellogg, a senior scientist at Millennium Predictive Medicine Inc. in Cambridge, said Spotfire's added support for visual-trellis and split-plotting capabilities would help in comparing different data sets with one another.

"Up until now, you could only view the same data in different ways," he said. "Now, you can split the data into adjacent visualizations and work with different subsets of the data, which is important when looking at data with many variables."

Tariq Andrea, a senior researcher at Pharmacoepia Inc., a \$104 million chemical development and drug discovery firm in Princeton, N.J., said he plans

to use Spotfire.net's visualization capabilities to help spot the degree of diversity among chemical combinations.

Andrea's research group will use the tool to generate 3-D graphs of chemical libraries that contain 100,000 molecules each. He said he hopes that by visually representing these libraries, the tool will help scientists more easily determine the size, flexibility and hydrophobicity (greasiness) characteristics of the chemicals.

"After we've done the data mining, we want to visualize the results and then put them in the hands of the end user," he said.

Analysts said graphical depictions of data enable users to more readily judge correlations and differences among data groups.

### Data Comprehension

"Visualization of data is a new area in reporting tools, because a lot of business intelligence analytics offer just tabular reports," said David Folger, an analyst at Meta Group Inc. in Stamford, Conn. "There is a value in tools that allow people to understand the meaning of data better."

"It's a question of the bandwidth of the user doing the analysis," said Roddy Martin, an analyst at AMR Research Inc. in Boston. "Some researchers can come up with trends from a heap of numbers, but doing 3-D data analysis, they may be able to see a correlation that would be difficult to see by just looking at the numbers."

Such visualization capabilities set Spotfire.net apart from competitors — such as SAS Institute Inc. in Cary, N.C., and Aegis Analytical Corp. in Lafayette, Colo. — in the statistical analysis space, added Martin. Spotfire.net 5.0 also allows users to access data and perform analytics via a Web browser from a corporate intranet and publish analysis results on the Web, which is important to large biotechnology and

manufacturing firms, said Martin.

"One problem manufacturers in the life sciences have is a fragmented IT architecture, which makes it difficult

to have access to the same information across multiple functional groups," said Martin. "Because Spotfire has Web-based capabilities, any user within the enterprise can access different data sources via the Web and do the analysis." ■

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## Spotfire.net 5.0

Spotfire.net includes a number of new data visualization capabilities:

- More than 1 million records can be analyzed visually.
- It provides access to relational databases such as Oracle, Microsoft Access, Sybase and Informix.
- It offers support for visual-trellis plots and split-plots data views.

## SQL Server 2000 Out to Adopters

BY JENNIFER DISABATO

Microsoft Corp. last week released its SQL Server 2000 to manufacturing. It will be followed by a live release starting next month for some customers.

The server, part of the Microsoft.Net platform, will go live for more than 100 enterprise customers during the next three months, the company said in a statement.

The SQL Server 2000 early-adopter program has had a few companies par-

ticipating for as long as six months, according to the company.

Last month, Microsoft suffered an embarrassing setback when top benchmark results for its SQL Server 2000 database were canceled by the Transaction Processing Council in San Jose because they were found to be non-compliant.

The company struck back soon afterward with new numbers that analysts said show that SQL Server 2000 is gaining on rival products.

Analysts said that Microsoft's Web-based server for e-commerce and data warehousing still isn't up to par with similar applications such as Oracle8i and IBM's DB2 but that the company is gaining ground. ■

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# A Pound of Prevention, An Ounce of Cure?

*Jude wonders if the costs of some security measures to stop potential hackers outweigh the benefits*

IN ONE EPISODE OF *The Simpsons*, Bart enters a radio competition and wins an African elephant. The elephant eventually gets bored with being tied up in the back garden, breaks free and heads off through Springfield, leaving a trail of destruction behind it.

The scene shifts to a peanut factory. One of the supervisors sees the elephant approaching, slams the gates shut and yells to his staff, "I knew it! I knew this moment would come! You all laughed at me for making you run through the emergency plans for half an hour before work every morning, but I knew it would pay off!"

I sometimes have the uneasy feeling that I take a similarly over-the-top approach with information technology security — whenever someone questions the justification for a particular security upgrade, it's very easy to cite the mythical horde of ravaging hackers we hear so much about in the press.

I know there are hackers who break into systems for fun or profit and can cause significant damage. But I can't help feeling that if you added up the cost of all the damage done by hackers in the past year, it would be insignificant compared with the amount of money spent on efforts to stop them.

## Top 10 Threats

This feeling has been brought into focus during the past week or so as we have attempted to gauge the breadth of our exposure to the SANS Institute's "Consensus List of the Top Ten Internet Security Threats."

For those who haven't seen the list, it's being touted as the 10 most significant technical vulnerabilities on the Internet and seems to be backed by everyone who is anyone in the world of Internet security.

I don't know how much support the list is getting elsewhere, but my "highly

scientific" survey (I spoke to a few colleagues at other companies) shows that about half of the big corporations in Europe seem to be taking steps to overcome those vulnerabilities.

However, I was surprised at the depth of feelings aroused when I attempted to mobilize some resources to create fixes in my own big corporation. I thought that our technical departments would jump at the chance to focus on only 10 vulnerabilities rather than every theoretical technical exposure highlighted by their evaluation copy of a system scanner.

That wasn't the case. I had lit the fuse but neglected to retire to a safe distance. Within a couple of days, e-mail rants taking sides in this great debate flew in all directions around our worldwide IT department, cc'd to everyone who might have the slightest interest and to an awful lot of people who didn't.

At one point, I found myself in the middle of a rather unusual argument with the internal auditing department on one side talking patch levels and configuration options and an engineering department on the other stating the case for a managed change-control procedure.

So much for my pre-employment resolution to keep my head down for a few months until I knew the lay of the land.

In the end, I think I found a relatively safe course through the storm: While the argument raged, I got the support of a few of the better engineers, and they quietly found and fixed a significant number of the vulnerabilities. We probably didn't find every vulnerability, but I believe that for 20% of the effort, we fixed 80% of the problems.

The next step is to put the infrastructure in place to deal with as many as possible of the remaining 20% of the problems, and it may take quite a bit of work. Management's main reservation is that if we start detecting technical

security vulnerabilities, then we'll have to start fixing them, and that's going to take a lot of time and money that we don't yet have.

It's an argument that seems a little head-in-the-sand at first, but it makes a little more sense as time goes on: There's little point in spending money on scoping out the problems until we can afford to fix them.

So now I have to push the problem up the management chain until I can find someone who's willing to pay for it. I hate asking for money — that's why I don't want to be an independent consultant. And all the time I've got the peanut factory supervisor's rogue elephant contingency plans in the back of my mind, wondering whether we're wasting money by overreacting to a threat that may never materialize.

The dubious joy of this job is that the only way I'll ever get a definitive answer to that question is if we do get hacked and we aren't ready.

## XXX Marks the Spot

On the subject of dubious joys, Internet pornography has reared its ugly head. My employer has long taken the view that if it treats its employees like mature professionals, they may actually act like mature professionals, so we don't actively monitor their Web traffic or maintain a list of banned sites.

That may seem amazing or even negligent to the proponents of active censorship, but, surprisingly, it seems to be working. A curious trawl through the logs over the past few weeks has shown that a much smaller number of people visit pornographic sites than I had expected from my experience at other, more censorious companies.

However, after one minor incident, I talked to human resources, and we agreed to ask senior management to send a memo to all staff pointing out that we'll be keeping an eye on the proxy logs. Then we'll see if we still have any employees stupid enough to jeopardize their jobs over a cheap thrill.

## Plan B

Incidentally, one of our engineering groups points out, quite correctly, that there's no way we can hope to keep up with the ever-changing list of pornographic Web sites. And if we don't know what we're searching for, we're going to have a hard time separating the pornographic URLs from the other

## SECURITYCHECKLIST

Just what are those top 10 security threats causing Jude such consternation? The SANS Institute's recently released "Consensus List of the Top Ten Internet Security Threats" includes detailed descriptions of each threat and recommendations on how to deal with them. Here's a quick rundown. To see the full report, go to [www.sans.org/topten.htm](http://www.sans.org/topten.htm).

1. Berkeley Internet Name Domain weaknesses.
2. Vulnerable Common Gateway Interface programs and application extensions installed on Web servers.
3. Remote procedure call weaknesses in `rpc.ttdbserverd` (ToolTalk), `rpc.cmsd` (Calendar Manager) and `rpc.statd` that allow immediate root compromise.
4. Remote Data Service security hole in Microsoft's Internet Information Server.
5. Unix sendmail buffer overflow weaknesses.
6. Unix `sadmind` and mounted-buffer overflow weaknesses.
7. Global file sharing and inappropriate information sharing via NetBIOS and Windows NT, Unix Network File System, or Macintosh Web sharing or AppleShare/IP.
8. User identifications, especially root/administrator with no passwords or weak passwords.
9. Buffer-overflow vulnerabilities or incorrect configuration of the Internet Message Access Protocol or Post Office Protocol remote-access mail protocols.
10. Default Simple Network Management Protocol community strings set to "public" and "private."

## LINKS:

**[www.sans.org](http://www.sans.org):** The SANS Institute is a research and education organization for systems administrators and security professionals that has more than 96,000 members. Its Web site is a must-read resource for every security manager.

800MB of daily log files.

However, I notice that many of the pornographic Web sites seem to use one of seven or eight banner ad exchanges, age checkers or traffic-counting services (such as Sextracker and XXXcounter), so instead of trying to track the pornographic sites, we can just search the logs for hits referred to one of these services.

This strategy won't catch everything, but it will catch most inappropriate Web use quite quickly and cheaply. We'll try it out for a couple of months just to see what happens. ■



Security  
Manager's  
Journal



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# Digital Certificates

BY ANN HARRISON

**D**IGITAL certificates are issued by a trusted third party known as a certification authority (CA). The CA validates the identity of a certificate holder and "signs" the certificate to attest that it hasn't been forged or altered in any way.

When a certificate is digitally signed by a CA, its owner can use it as an electronic passport to prove his identity. It can be presented to Web sites, networks or individuals that require secure access.

Identifying information embedded in the certificate includes the holder's name and e-mail address, the name of the CA, a serial number and any activation or expiration data for the certificate. When a user's identity is verified by the CA, the certificate uses the holder's public encryption key to protect this data.

Public keys are also employed by certificates that a Web server uses to confirm the authenticity of a Web site for a user's browser. When a user wants to send confidential information to a Web server, such as a credit-card number for an online transaction, the browser will access the public key in the server's digital certificate to verify its identity.

## Role of Public-Key Cryptography

The public key is one half of a pair of keys used in public-key cryptography, which provides the foundation for digital certificates.

Public-key cryptography uses matched public and private keys for encryption and decryption. These keys have a numerical value that's used by an algorithm to scramble information and make it readable only to users with the corresponding decryption key.

A person's public key is used by others to encrypt information meant only for that person. When he receives the in-

**DEFINITION**  
**Digital certificates** are data files used to establish the identity of people and electronic assets on the Internet. They allow for secure, encrypted online communication and are often used to protect online transactions.

## Verifying Identity: Certificates at Work



formation, he uses his corresponding private key, which is kept secret, to decrypt the data. A person's public key can be distributed without damaging the private key.

A Web server using a digital certificate can use its private key to make sure that only it can decrypt confidential in-

formation sent to it over the Internet.

The Web server's certificate is validated by a self-signed CA certificate that identifies the issuing CA. CA certificates are preinstalled on most major Web browsers, including Microsoft Internet Explorer and Netscape Navigator.

The CA certificate tells users whether they can trust the Web server certificate when it's presented to the browser. If the validity of the Web server certificate is affirmed, the certificate's public key is used to secure information for the server using Secure Sockets Layer (SSL) technology.

Digital certificates are used by the SSL security protocol to create a secure "pipe" between two parties that seek confidential communication. SSL is used in most major Web browsers and commercial Web servers.

## Hello and a Handshake

If a purchaser wants to connect to a Web site secured with SSL, his browser sends a "client hello" message to the Web server, requesting an SSL secured session. The Web server replies by sending the purchaser its server certificate.

The purchaser's browser will verify that the server's certificate is valid and signed by a trusted CA. The process of confirming that two entities want to establish a secure SSL connection is known as the SSL "handshake."

To initiate the handshake, the purchaser's browser will generate a unique, one-time session key encrypted with the server's public key and send the encrypted session key to the server. The server recovers the session key and decrypts the message using its private key.

This exchange verifies the identity of the Web site and ensures that only the browser and the Web server have a copy of the session key. The Web server then uses the session key to send encrypted information to the purchaser.

When the browser is in normal mode, a key or padlock icon in the lower corner of the browser looks broken or open. When an SSL connection has been established and the browser is in secure mode, the key becomes whole and the padlock is closed. ■

## New Uses For Digital Certificates

Digital certificates are now being used to provide security and validation for wireless connections, and hardware manufacturers are one of the latest groups to use them. Last month, VeriSign Inc. in Mountain View, Calif., announced its **Cable Modem Authentication Services**, which allow hardware manufacturers to embed digital certificates into cable modems to help prevent the pirating of broadband services through device cloning.

Using VeriSign software, hardware makers can generate cryptographic keys and corresponding digital certificates that manufacturers or cable service providers can use to automatically identify individual modems. "It appears that this is the very first time that certificates are being used at the point of manufacture in electronics products, where they are burned right into the read-only memory of [a] cable modem," says analyst Michael Harris, president of Kinetic Strategies Inc. in Phoenix.

According to VeriSign, the **Data Over Cable System Interface Specification** standard, which calls for the embedding of digital certificates in cable modems, sets the stage for next-generation broadband services such as pay-per-view, digital rights management and online software delivery and ensures interoperability among products from cable modem manufacturers and operators.

"This 'last-mile' authentication not only protects the value of existing content and services but also positions cable system operators to bring a broad new range of content, applications and value-added services to market," says Stratton Scavos, president and CEO of VeriSign.

— Ann Harrison



# The Perfect Swarm

Not quite, but scientists are using an experimental program called Swarm to model a changing world.

By Peter Panepento

**B**IOLOGISTS and political scientists are just part of the growing brigade of natural and social scientists who are going against convention and embracing the concept of agent-based modeling.

While it's still far from the scientific mainstream, agent-based modeling is rapidly gaining acceptance in disciplines as diverse as economics, ecology and defense. And software — most notably a program called Swarm — has been fueling its development.

Agent-based modeling allows researchers to create artificial worlds that model activity in the natural world.

Using Swarm, researchers design a series of rules to govern those worlds and then send players, called agents, to live under those guidelines. The researchers in essence create their own games, then use those games to draw conclusions and test theories.

## Planned Chaos

The scenarios are often chaotic and unpredictable, but they also give insight into the behavior of societies, economic markets or natural activities. Such insight may be used to help an economist determine how a market will behave, help

a political scientist predict voting patterns or help a biologist simulate bacterial growth.

"What's really exciting about Swarm is that it's useful to people in a lot of different disciplines. The cross-platform nature of it is fun," says Nelson Minar, a member of Swarm's original two-man design team and the founder of Popular Power Inc., a San Francisco-based technology company. "It's a major paradigm shift in how people understand our world. It provides a cross-disciplinary understanding of artificial phenomena."

Minar says Swarm has led the agent-based modeling charge because it has cross-disciplinary applications. And it has cross-disciplinary applications because it was developed at the Santa Fe Institute (SFI) in New Mexico, a private, nonprofit, research and education center that aims to foster interdisciplinary study.

SFI began developing Swarm in 1994 to give scientists a practical tool for creating artificial worlds. The software is still considered experimental, but it has been useful to scientists who are scratching the surface of agent-based modeling.

Those charged with developing Swarm are still learning its capabilities. For example, Marcus Daniels, the executive

director of SFI's Swarm Development Group, has spent two years trying to make Swarm accessible to what he calls "a scientific community that isn't comfortable with computers."

"Swarm is still considered very hard to use," says Daniels, who has created a CD-ROM version of the program and is creating a system that will allow users to access the Swarm model through a Web browser. "There is an infrastructure that people have to get used to."

## Less Than Accessible

Users say Swarm's cumbersome nature is complicated because it's written in Objective-C rather than C++. As a result, using Swarm is like working with Betamax in the days when VHS was starting to take over the home video world. It has some advantages, but it isn't as accessible as programs written in the more popular format.

Nonetheless, the program offers flexibility to researchers that newer, more user-friendly agent-based modeling programs such as Ascape, Repast

and StarLogo can't provide.

"We find [Swarm] to be very easy to use. It's been good for rapidly putting things together," says Michael North, a software engineer at the U.S. Department of Energy's Argonne National Laboratory in Argonne, Ill.

Swarm's flexibility has created a small but devout group of about 1,000 users who also serve as a support network for the Swarm brethren.

Researchers and computer scientists who have created agent-based models with the software gather each spring for an event called SwarmFest to present their findings. It's there that the true power of the software is revealed.

"I heard from everything from biologists talking about fish migration to political scientists talking about voting patterns," says North. "Swarm doesn't solve every problem, but it solves more than we could in the past."

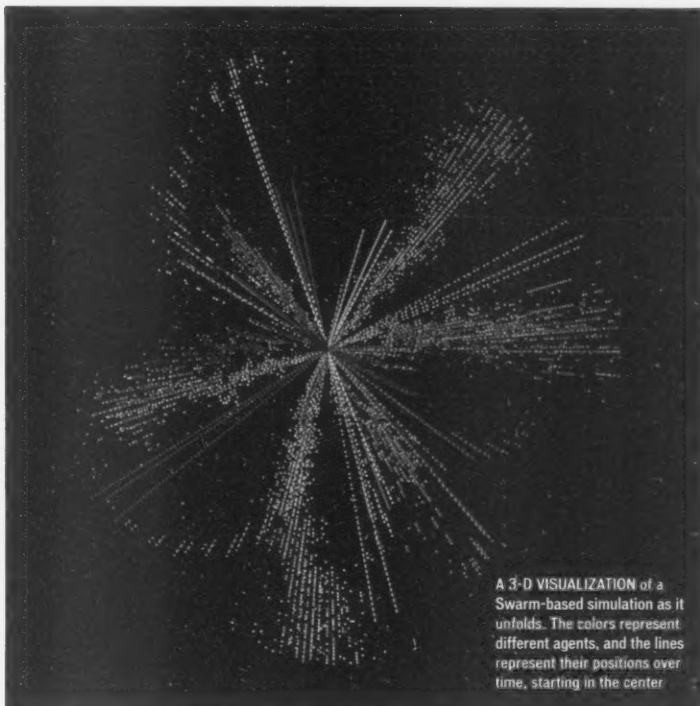
North is part of the brave new world of Swarm users who are responsible for its popular-

ity on the cutting edge of the research world. His laboratory is one of a growing number of government research agencies and defense interests that use agent-based modeling. The U.S. Navy, in fact, provides the primary grant to support the Swarm Development Group.

North used Swarm to help create a series of models that look at levels of competition in the age of deregulation of electric utilities. These models are helping the government determine, among other things, the number of companies needed to create true competition in a particular market, and they've even helped researchers identify when companies are colluding to drive up electricity prices.

"The real breakthrough is agent-based computing and Swarm," North says. "We need to model change, and Swarm is a practical agent-based tool that allows us to model change effectively." ▀

*Panepento is a freelance writer in Erie, Pa.*



A 3-D VISUALIZATION of a Swarm-based simulation as it unfolds. The colors represent different agents, and the lines represent their positions over time, starting in the center



# Juggling Content

Load balancing across servers gets the right data to the right user at the right time. By James Cope



**BRITANNICA.COM BALANCED LOADS ACROSS DATA CENTERS** because "high availability was part of the design criteria for the site from the beginning," says CIO Doug Shuck

**W**HEN A USER types a URL into the address window of a browser or clicks a link, routers on the Internet need only a second or two to take the user to where that information is stored. But ferreting out the specific documents and graphics — the content — and retrieving it from a busy Web site for display on the user's PC can take more time than some users want to spend.

Thousands of users could be looking for the same information or performing the same transactions at the same time and place. To ward off gridlock and delays, companies and service providers have turned to load balancing.

Load balancing, especially load balancing that uses Web switches, is "the glue that holds e-commerce together," says Ron Westfall, an analyst at Current Analysis Inc. in Sterling, Va.

Sometimes called Layer 7 switching or content switching, load balancing is a way of identifying what users coming to a Web site want and spreading those requests across multiple servers or data centers. Layer 7 refers to the routing of data packets based on information in the highest application layer of the Open Systems Interconnection network model.

The simplest form of load balancing employs a special-purpose computer that sits between a site's Web servers and the router that connects the site to the Internet. Software in the load balancer detects when one server is too busy to accommodate the incoming requests and switches the request to another server at the site. The process is seamless to the user.

As the amount of content housed on Web sites increases and the variety of applications used to create that content becomes more diverse, simple load balancing is no longer adequate. This is especially true for large name-brand sites such as Britannica.com Inc. in Chicago, which hosts a graphics-rich online encyclopedia and supports sophisticated search capabilities.

When Britannica deployed the site two years ago, CIO Doug Shuck says, the company was under no illusion it could control the performance of the Internet after content left its data centers and headed to users' desktops.

But Shuck says he wanted to minimize delays. "When we went online, besides the recognition of quality, we wanted to preserve the brand," says Shuck. "High availability was part of the design criteria for the site from the beginning."

"We started [building the infrastructure] with three points of distribution," says Shuck. "One was at our corporate facility in Chicago. Others were co-located at hosting centers in Sunnyvale, Calif. and Herndon, Va."

Servers at these centers are now set up in three tiers consisting of Web servers, application servers and database servers, Shuck says. This makes managing servers easier because like applications are located on the same machines. It also increases the processing power available for handling bursts of traffic.

## Dynamic Balance

Shuck says he balances traffic across servers at each location using Big-IP, a brand of load balancer from F5 Networks Inc. in Seattle. He says the F5 equipment dynamically balances requests for content over the appropriate servers within each site. It detects server problems and shifts the load to "one or more machine sets [clusters of servers] per location," Shuck says.

To further enhance the user experience, Shuck set up a means to route user requests to the data center that will respond the quickest.

He placed 3-DNS Controllers, also from F5, at each data center. Shuck says the 3-DNS units look at where the user comes from and compare the response time for that interaction to the response times of servers at the other Britannica data centers.

Then, they automatically select the route and data center that are predicted to give the best performance. Next, F5's Big-IP load balancers take over to spread traffic across multiple sites. Alton WebSystems Inc. and Cisco Systems Inc. have similar technology, but their products are built into load balancers, not sold as separate units.

Balancing loads across applications that are native to the Internet, such as those that handle e-mail and serve up

HTML documents, is one thing. Balancing loads across different applications, however, requires a new breed of equipment called a Web switch.

Web switches look into the packets at Layer 7, which contains information on applications that interface with the network, says Stan Schatt, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Mike Shoupe, a network engineer at PSINet Inc., a global network out-sourcer and Web hosting company in Ashburn, Va., uses Web switches made by San Jose-based Alteon Websystems to balance loads across applications. Alteon agreed late last month to be acquired by Nortel Networks Corp. in Brampton, Ontario, for \$7.8 billion.

Other companies, including Sportal Ltd., a sporting events hosting company in London, and Digex Inc., a Web hosting and application provider out-sourcer in Beltsville, Md., use switches from San Jose-based Cisco.

Although Shoupe uses F5's Big-IP in some applications, he says F5's products were designed primarily to identi-

fy requests for Web content, such as HTML pages, and send those requests to the server that holds that content and is most available to provide it.

Shoupe says the more robust Web switches from Alteon and Cisco can read the Internet data packets contained in user requests to identify the application that processes that data and point the request to the servers on which the application resides.

That added intelligence of Web switches ensures a persistent session: a connection that stays intact until information has been retrieved or a transaction has been completed, says Charles Boyle, director of research and development at Digex, which hosts Web sites for large companies such as St. Louis-based Trans World Airlines Inc. and J. P. Morgan & Co. in New York.

Changing an IP address in the middle of a transaction, which Boyle says service providers such as America Online Inc. routinely do, can break the session, preventing the user from completing his purchase.

By reading cookies (small files on

the user's PC) that uniquely identify the user and determining from data packets which applications are required to complete a transaction, the Web switch can track the user session and keep the user connected and the transaction process intact until it has been completed.

High-level switches become important when users need to balance traffic based on applications that haven't typically been used in a Web site environments, such as enterprise resource planning software from Germany's SAP AG or Pleasanton, Calif.-based PeopleSoft Inc.

Depending on configuration, prices for Web switches can run from \$10,000 to more than \$100,000.

The new Web switches can balance loads during e-commerce transactions that use Secure Sockets Layer connections to maintain privacy. Westfall says they can also be set up to manage load across application servers dedicated to mobile and wireless protocols, such as those that handle Web traffic through Wireless Application Protocol. ■

## Cache for The Cause

**Load balancing** can spread user demand over servers and data centers. It can even connect the user to the closest available server.

But traffic flow to end users can still be clobbered by congestion on the public Internet.

That's particularly true during Web rush hours when users log on to view or participate in a special event.

An example was **Euro2000**, Europe's championship soccer tournament held this spring in Brussels. Sportal Ltd. in London designed the infrastructure for the event and hosted the official site at [www.euro2000.org](http://www.euro2000.org).

To support the 1.4 billion hits between late March and mid-June—a level that put the site in the Guinness Book of Records as the most highly trafficked site in Internet history—**Nial Pearson**, Sportal's chief technology officer, designed a caching scheme.

Caches are special servers that hold the data that users request most from a given site.

Pearson says his firm set up "cache farms" in major cities across Europe with servers from **CacheFlow Inc.** in Sunnyvale, Calif. Sportal deployed Cisco Web switches at Sportal's main data center in Los Angeles and at a backup center in London and configured the servers at both data centers to redirect traffic to the caches.

That, Pearson says, made it possible to honor requests very quickly. Moreover, Pearson set his Web servers to automatically refresh the caches anytime data on the server changed, so content was always fresh. That's important because caches generally are set to fetch the most frequently requested Web pages at predetermined intervals, resulting in a mixture of old and new data in a cache.

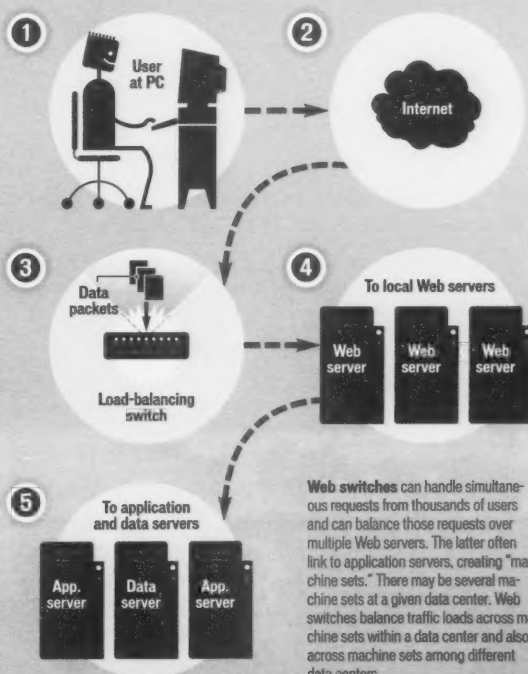
And the fact that **Euro2000** content was always served from the cache meant "there was almost no load on the servers in the data centers," according to Pearson. —James Cope

## HOW LOAD BALANCING STEERS WEB TRAFFIC TO THE PROPER SERVER

Information in data packets triggers Web switches to tap servers that hold the content requested

- 1 A user types in a URL or clicks on a link containing a Web site address.
- 2 The browser in the user's PC (the client) issues a request through the Internet for a connection with the Web site specified by the address (the host).
- 3 A Web switch (load balancer) accepts the connection on behalf of the resources at the Web hosting site. The Web switch then signals the client through the Internet that a connection between client and host has been established.
- 4 The Web switch reads information carried by data packets about the content that the user is requesting—for example, what content is being requested, where the content is located and whether or not the individual requesting it has been approved to access the content. The Web switch also can determine the quickest path between the client and server, and route requests to another data center when appropriate—or even fulfill requests from multiple servers across several data centers.
- 5 Using information it has gleaned about the content requested, the Web switch routes the request to the server best able to respond quickly and fully to the user's request. It detects servers that have failed or are slow and routes traffic to servers that are more available.

Web switches examine data packets and route them according to user needs



**W**HEN AN ONLINE brokerage's trading site goes down, it doesn't just risk alienating customers. According to the U.S. Securities and Exchange Commission, it might actually be liable for any damages customers suffer during the outage.

For Omaha-based Ameritrade Inc., that wasn't the only impulse to create a better site. Times have grown tougher since 1988, when it was the first brokerage to offer automated touch-tone telephone transactions, and even since 1996, when it became the world's first online-only brokerage.

By March of last year, *Barron's Online*, owned by Dow Jones & Co., awarded the Ameritrade site only two of four possible stars in a ranking of online brokerages. Ameritrade brought up the rear, in 21st place out of the 22 brokerages ranked. Accounting for that ranking were such things as the site's customer service, reliability, availability, price per trade and ease of use.

In contrast, today, on San Mateo, Calif.-based Keynote System Inc.'s consumer index of the top 40 most available sites, Ameritrade is ranked first. On the Online Broker Index, which tests brokers by doing multiple, varied transactions, Ameritrade is often ranked first for reliability and is often in the top two or three for performance.

Ameritrade is the fifth-largest U.S. online brokerage. Its turnaround was the result of doing predictive testing rather than reacting to failures, updating and testing hardware and software together and creating a separate testing organization and giving it more clout.

Since beginning those changes in March 1999, the company has invested more than \$100 million to make them work.

#### Predictive Testing

Ameritrade's primary goal is to make sure its customers can complete trades. Before the makeover, Ameritrade had tried to achieve that by coding its applications, selecting hardware, trying to fine-tune

the code for the hardware and then putting it all on the live Web site. But that was the equivalent of flying blind; Ameritrade wouldn't know where any obstacles were until the software ran into them. That's because a system can work fine at 2,491 transaction/sec., then fall apart at 2,492 transaction/sec.

But with lost orders, defecting customers and the threat of litigation, Ameritrade chose to spend its money ensuring that code runs really well before deploying it rather than just doing autopsies of dead sites.

Eliminating those kinds of failures takes sophisticated performance- and load-testing software that can simulate the momentary, crippling peaks Web sites experience. Ameritrade selected Sunnyvale, Calif.-based Mercury Interactive Corp.'s LoadRunner, for which it already had a license after hiring Computer Sciences Corp. in El Segundo, Calif., to analyze its Web site two years ago.

Furthermore, Jerry Johnston, Ameritrade's director of quality, had performed a "bake-off" among load-testing products from Segue Software Inc. in Lexington, Mass., Compuware Corp. in Farmington Hills, Mich., and Mercury Interactive at his previous company, USF&G Corp., and ultimately chose Mercury.

Ameritrade writes scripts using WinRunner that test user-order behavior on the site. "We're in the process of creating just about every conceivable type of order that can be made to develop an automated regression test script using WinRunner that covers equities, options, mutual funds, complex options. There are literally thousands of combinations," says Johnston.

Such simulations allow Ameritrade to break a test version of its site repeatedly during testing, fix the problem and then load those changes onto the real site. It can also ensure that there aren't any hidden capacity issues or defects such as memory leaks, which are caused when a process doesn't release the memory it's using after it finishes. Eventually, if not stopped, such leaks will cause a system to crash.

"Those are typically very hard to diagnose and remedy. By having a full-blown performance envi-

**WEB SITE  
MAKEOVER**

How did Ameritrade make sure online trades went through? It ran predictive testing, created a stand-alone test group and tweaked hardware and software at the same time.  
By Mathew Schwartz

**T**est

# Redesigning Ameritrade

The stock-trading site used testing to predict performance, tweaked applications for specific hardware and created a separate, more powerful testing group.



## Predictive Testing

**1** Ameritrade used scripts written for Mercury Interactive's WinRunner to predict site performance under every possible type of user behavior. That's a far cry from the previous method, in which Ameritrade did its best development work, put the code on the live site and then tweaked it.



## Focused Development For Specific Hardware

**2** Ameritrade found that choosing the right hardware wasn't enough — it also had to tweak its applications to take best advantage of that hardware. For example, the company says, it got an eventual 700% increase in site performance from EMC disk storage subsystems only because it tweaked its applications to run on the new hardware.



## Creating a Separate Test Team

**3** To emphasize the importance of testing and to make sure enough time was allowed for it in the development process, Ameritrade pulled together testers from separate development groups into a new test team. The team could also enforce more consistent test methods.

# st Case



# Test Case

ronment that you can run well above product stress levels, we're able to do far better performance numbers," says James Ditmore, Ameritrade's CIO. In addition, frequent testing between software versions and site iterations gives Ameritrade a paper trail: It can compare site performance based on software version, versions of the site or the month.

When the site does break, whether in testing or on the live servers, the programmers have another new line of defense: regression testing. The benefits are simple: Since changing a piece of code can unintentionally break an application that was working fine before, regression testing allows developers to roll the application back to a state where it's working and then compare the two versions of code to see what went wrong.

"Often, developers and development groups are more focused on their release and fixes and enhancements that the release includes, so I'm interested in making sure that not only those enhancements work the way they need to, but that all the prior code in the prior release is still working the way it should," says Johnston.

## Tweaking

The No. 1 myth of Web site scalability is that when things slow down, you can just pop in a new Web server. Not so, says Ditmore: Good hardware is important, but it isn't nearly the whole story. Ditmore estimates that 50% of the performance gains of the new site came from application and database engineering, which meant not only writing those applications but also testing and refining them continually until all possible bottlenecks were eliminated. Twenty-five percent came from doing the same refining process on the network, and just 25% resulted from hardware improvements.

What's critical to truly realizing the benefits of performance engineering, however, is integrating those three categories. For example, when Ameritrade switched from Sun Microsystems Inc. to EMC Corp. disk storage subsystems and saw transaction speeds increase 700% over eight months, it wasn't necessarily because the EMC hardware or other infrastructure was faster.

"Without having the application engineered so it had headroom, you could have put EMC in and wouldn't have seen the change," Ditmore says. Ameritrade spent nine months tuning its network and servers.

When upgrading its proprietary Ameritrade Order Management (AOM) database production environment and moving to an EMC disk subsystem, Ameritrade tested with LoadRunner. "We ran into things

like poor performance on certain transaction types — worse than in the existing production environment — so we used that test as a way to tune that new environment, to maximize performance," says Johnston.

"For example, we were getting defunct processes on the system," he says, meaning that valuable computing power was being spent on processes that the current version of AOM no longer needed.

When Ameritrade finally upgraded its Sun servers, which had ably handled Ameritrade's previous three-year, 120% annual growth rate, to EMC disk subsystems and tweaked the applications and network for EMC, the numbers really shot up: Throughput on the trading system nearly doubled, increasing from 2,500 to 4,500 transaction/min. "Unix vendors' storage solutions don't match what EMC has to offer. Basically, EMC has tuned their stuff for much higher input/output loads," says Ditmore.

Furthermore, as a result of load testing, says Johnston, "the implementation was able to go in very smoothly compared to what would have happened without load testing. And it was transparent to customers."

Over the past year, Ameritrade has also been improving its network, making it fully switched rather than routed. This speeds throughput because the switches already know where traffic should go, whereas routers must first translate protocols and addresses. The difference "can take 20% to 30% off the networking time," says Ditmore.

The trading and clearing engines run off of two Sun E10000s grouped in a high-availability cluster. That configuration was the result of network engi-

neering. "Because we have that redundancy, we've eliminated single points of failure," says Ditmore.

Inevitably, failures do happen, which is why Ameritrade has fully redundant systems. In its Omaha data center, Ameritrade has more than 30 Sun 4500 Web servers running Unix for the primary applications and some running Windows NT for the networking directory. Those servers work in tandem with Seattle-based F5 Network Inc.'s Big/Ip, which sits between the network router and the server array and routes Web queries to the most available server.

To improve site reliability, Ameritrade also created an exact duplicate of all its systems at a data center in Kansas City, Mo.

A good game plan includes knowing what to do when errors occur. Ameritrade monitors every database, network and server. Over the past year, it also added alerts to see if a component is in trouble.

More recently, it added tool sets to do correlation across errors. For instance, if a circuit fails, it is likely that every component attached to that circuit will report errors as well. Error correlation tools get to the root of the problem more quickly. "It can take a 15-minute analysis and make it a less-than-15-second analysis to allow you to replace a card or change the network configuration immediately," says Ditmore.

Above all, he notes, he has a very well-trained operations staff that understands the systems and an engineering team that can provide emergency second-level support.

All of Ameritrade's efforts have paid off. According to Keynote Systems, transaction times are 700% faster than they were just eight months ago. Likewise, reliability has shot up, with Ameritrade being ranked by Keynote as one of the three most reliable sites. Recently, *Money* magazine ranked Ameritrade and Boston-based Fidelity Brokerage Services Inc. as the No. 1 online brokerages.

## Culture Shift

There is one thing Ditmore won't do when updating the Web site, and that is what he derides as "the Microsoft approach": going live with a site or application and letting end users debug it for you. Besides the expense of fixing an application once it's live, there's the bad publicity and help desk inundation.

Before, testers were part of the various application development or Web groups. That was bad because when pushed for time, testing often lost out. Creating one group, which reports to Johnston, simply gave testing more clout. In addition, it allows Ameritrade to easily reallocate testing resources. "We can do cross-training, then utilize testing resources across different groups," says Johnston.

Now, Ameritrade is working to embed full regression testing and more thoroughly develop testing processes in the full production environment, so that actual production code — not an approximation or older version — is always being tested.

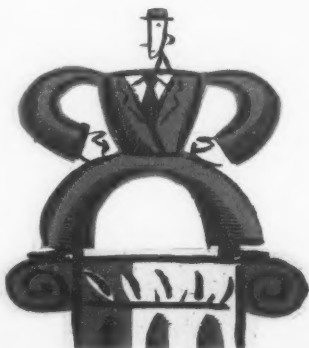
"We have a testing group, and the development teams typically hand off testing during system-level testing, after unit testing and as part of the software and hardware integration. So load testing is handled by the test group. We have a test group that's focused on it, but again, if the unit and regression test are completely aligned, then the stress and load tests are aligned in the new release," says Ditmore.

Why the emphasis on testing? It makes for a quality Web site. "We're trying to ensure that everyone understands the benefits of doing it right, as opposed to trying to add quality at the end of the factory line," says Ditmore. ■

# “

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# Start-up Navigates Online Sales Channels

*OrderFusion offers sales-side order management apps for e-commerce firms*

BY AMY HELEN JOHNSON

**W**HEN ENCAD Inc., a San Diego-based manufacturer of wide-format ink-jet printers, wanted to build an e-commerce site, it knew it had to offer a level of service over the Internet that was equivalent to the one its customers received from its resellers. What sold Encad on Orders of Magnitude from OrderFusion Inc. in San Diego was that the package had an integrated customer service interface that would allow employees in the call center to look up Web-generated orders when buyers needed help, says Rodney Palmer, manager of Internet development.

Orders of Magnitude debuted in 1996 as a generic order management system targeted at direct marketing, says OrderFusion CEO Tom Hennings. The company has since expanded the product to include other sales channels, key among them the Internet, by developing an application that produces an online catalog, accepts and processes orders, handles payment, tracks order status and manages returns.

The company is part of the business-to-business e-commerce application market, which Boston-based AMR Research Inc. projects will reach \$16 billion in sales by 2004.

In the recent past, the focus was on automating the supply chain. B2B applications from market leaders Ariba Inc. in Mountain View, Calif., and Commerce One Inc. in Pleasanton, Calif., were designed to help buyers manage their procurement processes.

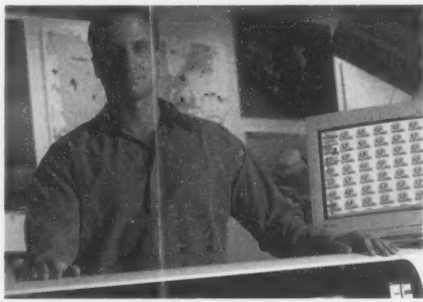
But they left a hole on the seller's side of the equation, says Carl Lenz, an analyst at Gartner Group Inc. in Stamford, Conn. This gives OrderFusion an opening to provide centralized tracking of orders and related changes, as well as

shipping and fulfillment.

What sets Orders of Magnitude apart from other sell-side applications, says OrderFusion's vice president of marketing, Bob Harrington, are capabilities like the ones singled out by Encad — the ability to disseminate a unified set of information about an order and a

customer throughout an organization's multiple sales channels. A unified data model makes this possible; Orders of Magnitude collects information from all the sales efforts, stores it centrally and makes it available online to both internal employees and external customers and partners.

The unified data model also allows Orders of Magnitude to serve up custom catalogs for buyers to browse. Encad will implement this feature in the



**CEO TOM HENNINGS:** OrderFusion makes e-commerce order information accessible throughout a company's sales channels

## OrderFusion Inc.

**Location:** 10180 Telesis Court, Suite 400, San Diego, Calif. 92121

**Telephone:** (658) 450-4800

**Web:** [www.orderfusion.com](http://www.orderfusion.com)

**The technology:** Sell-side e-commerce application lets suppliers link to procurement systems, including electronic marketplaces.

**Why it's worth watching:** Its unified data model supplies identical customer and order information to multiple sales channels, like Web sites and call centers.

### Company officers:

- Tom Hennings, CEO
- Rob Walrath, co-founder and vice president of operations
- Mont Rothstein, co-founder and vice president of engineering

### Milestones:

- 1996: Founded
- 1998: Orders of Magnitude is released
- September 1999: Partnership

with Ariba Inc. formed

- May 2000: Orders of Magnitude Version 4.0 released

**Employees:** 85; 153% annual increase since founding

**Burn money:** \$16 million; ABS Capital Partners, Generation Capital Partners LP

**Products/pricing:** Orders of Magnitude 4.0; average installation costs about \$500,000

**Customers:** Boise Cascade Corp., SpeedGreetings.com Inc., Encad Inc. and others

**Partners:** Ariba Inc., Oracle Corp., Sun Microsystems Inc., Microsoft Corp. and others

### Red flags for IT:

- The product is weak on internationalization features.
- OrderFusion faces heavy competition within its niche.

second phase of its project, when the resellers gain Web site access for placing and monitoring orders, says Palmer. Resellers get different prices than retail customers, he notes. The customization capabilities will also allow Encad to offer a two-click reorder option for returning Web customers, based on their last purchase of printing supplies.

Palmer says he has only minor complaints about Orders of Magnitude, including some initial problems with credit-card verification, a desire for a more streamlined administration interface and a request for a larger set of standard reports.

OrderFusion is working on internationalization, custom quote-generation capabilities, and product configuration, Hennings says.

OrderFusion claims rapid growth in sales but declined to reveal sales or profitability numbers. The vendor has raised \$16 million in venture funding to date.

## Make-or-Break Agreements

OrderFusion will face stiff competition, says Lenz. A supply-chain management vendor or a larger sell-side vendor will develop products that do what OrderFusion's products do today, he says.

To win new customers, OrderFusion must forge partnerships with the procurement-side vendors and the systems integrators who are building the electronic marketplaces. It might be acquired by a buy-side company to fill a hole in order management functionality, says Lenz.

Hennings acknowledges that the buy-side companies are complementary, not competitive, but he says approaching Orders of Magnitude as a logistics application that plugs into a procurement infrastructure doesn't give credit to its range of capabilities. It blends electronic and human marketing and sales efforts, he says, and that human touch will give it a long life. "A lot of people get involved [in such a transaction] and will continue to for the next decade," he says. ■

*Johnson is a Computerworld contributing writer in Seattle. She can be reached at [amyhelen@pobox.com](mailto:amyhelen@pobox.com).*

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## Execution Is All

Carl Lenz, a research director at Gartner Group, says no sell-side e-commerce vendor has superior technology. So the competition comes down to comparing features, carving out niches and demonstrating an ability to execute by winning new customers.

OrderFusion's pick, pack and ship functionality sets it apart from rivals, says Lenz. This involves tracking orders by line item, splitting up an order, organizing shipping and drop-shipping and managing inventory. But it's a slim competitive advantage, he says. Other sell-side products like those of SpaceWorks Inc., Ironside Technologies Inc. and Intershop Communications will have this functionality in their next releases.

## Web Business Manager Suite

SpaceWorks Inc.  
Rockville, Md.  
[www.spaceworks.com](http://www.spaceworks.com)

SpaceWorks is a strong competitor in the order management arena, says Lenz. He gives the nod to Orders of Magnitude for its inventory-tracking and customer-facing features for facilitating orders. But in terms of marketing savvy and the demonstrated ability to land large customers, SpaceWorks wins.

## Ironworks and Integrated Solutions

Ironside Technologies Inc.  
Pleasanton, Calif.  
[www.ironside.com](http://www.ironside.com)

Ironside's key differentiator is the ability to tightly integrate with midmarket back-end systems from J. D. Edwards & Co., Marcam Solutions, System Software Associates Inc. and SAP AG, making it a good choice for enterprises already running these applications, says Lenz. In addition, he says, Ironworks has a translation layer that enables it to act as an integration hub for companies that participate in multiple electronic marketplaces.

## Enfinity

Intershop Communications  
San Francisco  
[www.intershop.com](http://www.intershop.com)

Intershop has products on par with those from SpaceWorks and Ironside, says Lenz. The suite fits into multiple sales models, ranging from direct consumer sales to business-to-business marketplaces. Intershop has blue-chip customers like Motorola Inc., Sony Corp. and Deutsche Telekom AG, and it powers international sites selling in Europe and Asia. — Amy Helen Johnson



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ED GABRYS is one of many IT security professionals who are adding special certifications to their list of credentials. "My job is a broad mix now," he says.

# Secure With Your Security Pros

With the increased demand for IT security professionals comes a call for more security skills certifications. Here's a look at the top one and what it will do for your career. By Deborah Radcliff

**F**IRST CAME ISACA. Then came CISSP. And now there's GCIA, GCFA and CCFT.

We're talking security certifications here — dating back to the 1980s, when the best gig in town was the Information Systems Audit and Control

Association (ISACA).

As the mainframe gave way to client/server computing, the Certification Information Systems Security Professional (CISSP) was born. The CISSP is now the most common security certification sought by employers looking for security managers, vice presidents and

chief security officers.

But over the past six months, security certifications have started to specialize into subset areas, including firewalls, intrusion detection and computer investigative forensics.

Such is the path Rob Paszko took — at least up to the CISSP level.

Now, Paszko, an incident response and vulnerability manager at Du Pont Co. in Wilmington, Del., says he's curious about the latest certifications.

Paszko says the new certifications are complementary to the coveted CISSP because they fill a need for hands-on information security professionals in specialty areas.

"There will be specialists

and general practitioners in information security departments. I consider myself a general practitioner," he says.

The CISSP, say Paszko and others, falls more into the "security generalist" category. The certification requires high-level proficiency or knowledge in everything from public-key infrastructures (PKI) to telecommunications security to disaster recovery and physical security.

The CISSP, which costs \$450 to sit for the exam, has long been a requirement for senior-level government security practitioners.

And for the past two years, CISSP certifications have also made top-level security professionals much more marketable in the private sector, says Tracy Lenzner of Lenzner and Associates, a security headhunting firm in Las Vegas.

## Other Certifications

With only 3,000 CISSP certification holders, generalized CISSPs aren't so easy to find, according to Lenzner. So in the interim, employers also consider other certifications, such as Redwood City, Calif.-based Check Point Software Technologies Ltd.'s Firewall-1 and San Jose-based Cisco Systems Inc.'s Pix Firewall certifications. They also look for Plano, Texas-based Entrust Technologies Inc.'s PKI, along with non-security certifications like Novell and Microsoft Certified Network Engineering (MCSE).

This is the professional model followed by People's Bank in Bridgeport, Conn. In May, Ed Gabrys, a senior systems security specialist at the bank, took his CISSP exam at Dunedin, Fla.-based International Information Systems Security Certification Consortium Inc., the nonprofit organization behind the CISSP.

Gabrys says that while answering 250 questions was brutal, it didn't take a rocket scientist to pass the exam.

His background included some work in security assessments, intrusion detection and antivirus protection, which Gabrys says he learned from a Big Five consulting firm that did such assessments for his company.

He says it was just a matter of book learning for the portions of the test where he didn't have hands-on experience.

## Resources

**www.isaca.org** — The Information Systems Audit and Control Association and Foundation  
**www.isc2.org** — International Information Systems Security Certification Consortium Inc.  
**www.sans.org** — The SANS Institute's course schedule for:

**GCIA** — GIAC Certified Intrusion Detection Analyst  
**GCFA** — GIAC Certified Firewall Analyst  
**GCIX** — GIAC Certified Unix Analyst  
**GCNT** — GIAC Certified NT Analyst

**www.htcn.org** — The High Tech Crimes Network Certifications include:

**CNSP** — Certified Network Security Professional  
**CCFT** — Certified Computer Forensic Technician  
**CCCI** — Certified Computer Crime Investigator  
**CCCP** — Certified Computer Crime Prosecutor  
**CCCA** — Certified Computer Crime Attorney

— Deborah Radcliff

"My job is a broad mix now," says Gabrys. He says the CISSP enabled him to move into his desired role as a security policy developer while leaving the detail work to a Certified Novell Engineer, an MCSE and a Citrix Systems Inc.-certified engineer (for Microsoft Corp.'s thin client).

## Filling in the Blanks

But with security threats and solutions growing more complex, employers are seeing a need for hands-on workers to add specialty security certifications to their training portfolios, says Lenzner and others.

In the past five months, organizations like the SANS Institute and the High Tech Crimes Network have started to offer such certifications.

Paszko and Gabrys have followed the emergence of specialized certifications, particularly for those hands-on workers in their information security departments.

"If you need to be very focused in intrusion detection, a SANS course on [intrusion detection systems] is a good place to go," says Gabrys. "But if you want to tell an employer, 'I have a particular baseline of security knowledge,' the CISSP is a good way to go." ■



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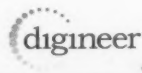
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**Application Systems Business Analyst.** Job location: Chicago, IL. Duties: Define project, refine specifications, manage the prioritization and execution of software implementation & enhancements. Plan, analyze, design, configure & perform cut-over activities needed to implement Enterprise Resource Planning (ERP) & Customer Relationship Management (CRM) software. Support installation of new releases, develop application interfaces, make required modifications & ensure successful testing & conversion of installed programs. Work closely with clients & internal staff to customize software packages to client's business needs & to identify, communicate & resolve project issues. Implement Onyx and/or ERP software & BPCS Financials using AS/400 operations, SQL, Query/400, & OS/400. Requires B.S. or foreign degree equiv in Comp. Sci., Comp. Eng., Bus. Admin., Accounting plus 2 yrs exp. in the job offered or 2 yrs exp. as a Financial Applications & CRM Consultant/Programmer/Analyst. Exp. which may have been obtained concurrently must include: 2 yrs implementing CRM software systems like Onyx or ERP software like BPCS Financials and 2 yrs exp. working with AS/400 operations, SQL, Query/400 & OS/400. Salary: \$55,000/yr. Send resume to Teri Allen, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606.

**Full-time Developer in Client-Server application development and programming, relational database design, development and implementation of computer programs using ORACLE Developer/2000 (Forms 4.5, Reports 2.5), PL/SQL, SQL Plus, SQL Loader, C, OOPS and C++.** Must have a minimum of a Master's degree in Computer Science or Information Systems, or a related field. Must have excellent written and verbal communication skills. The candidate must also possess customer service skills. PCS is a smoke-free working environment and offers competitive salary and benefits. Please send resume and cover letter to: Mark Federman, PCS, Inc., 1415 N. Dayton, Ste. 3S, Chicago, IL 60622.

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**Java Developer**

Requires 2-4 years total experience; 1-2 years Java development: servlets, JSP, and web application server experience. Prefer a B.S. in Computer Science or Engineering, Visual Age for Java, WebSphere, MQSeries and C++ experience is a plus.

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**Oracle Consultant.** Job location: Chicago, Illinois. Duties: Utilize Designer/2000 for logical, physical and datamodeling. Implement production rollout, installation and configuration of Oracle in a stand alone and parallel cluster environment on OS platforms including UNIX & Windows NT. Resp. for requirements gathering, system and data modeling. Identify business functions through planning, writing specifications and implementing. Write technical specifications and pseudo code for each business functions and processes. Create performance parameters and implement plan for the application deployment. Write, extract, transform and load procedures in PL/SQL. Soloaders scripts for building the staging area, database optimization, performance tuning of data warehouse. Requires: M.S. or foreign equiv. in Comp. Sci. or related field plus 3 years exp. in the job offered or 3 years exp. in a Application Designer, IT Consultant or Comp. Support position. In lieu of M.S. and 3 yrs of exp., employer will accept B.S. plus 5 yrs of progressive exp. Exp. which may have been obtained concurrently, must include: 2 yrs using Soloaders Scripts in PL/SQL and 2 yrs exp. programming Oracle databases. Salary: \$84,000/yr. Send resume to Teri Allen, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, Illinois 60606

**SR. PROGRAMMER ANALYST**

Design & implement datawarehousing principles, design & develop processing modules, write hi-speed loader. Enhance/maintain bus. s/ware & computer programmers, fine-tune applics., write code, prep. test plans. Install s/ware ensuring proper connectivity between client & server machines. Develop queries for data manipulation & interface classes, perform system integration and documentation. Provide tech. support; supervise jr. prgrmr/analysts. Utilize Visual Basic, C/C++, MS-SQL Server, GUIs & Crystal Reports. Must have Master's degree in Comp. Sci., Engineering, Math or related area. At least 2 yr exp. in similar position. 40 hr/wk. Competitive salary w/ excellent benefits.

Send resume & salary req'ts to: Blockbuster Inc., Attn: Corporate Recruiter, 1201 Elm St, Dallas, TX 75270 or email it to us [recruiter@blockbuster.com](mailto:recruiter@blockbuster.com) REF# ISM0024 Blockbuster promotes a smoke-free and drug-free environment and is an equal opportunity employer.

**Sr. Consultant/Implementation Analyst.** Job location: Chicago, IL. Duties: Install, configure and implement Oracle Applications. Implement RMAN and OEM for Oracle Enterprise wide database management backup and recovery procedures. Install and configure Web Logic server for SUN OS 5.6. Install, support and maintain Oracle Apps 11.0.3 and databases for integration of Oracle Financials and Order Entry modules. Monitor physical, logical design, configuration and performance tuning of the B2B database for order processing. Provide support to software developers and team lead. Requires: M.S. or foreign degree equiv. in Comp. Engineering, Comp. Sci. or a related field plus 3 yrs exp. in the job offered or 3 yrs exp. as a Database Analyst/Programmer. Exp. must include 2 yrs of exp. using Oracle systems. In lieu of Master's degree with 3 yrs of exp., will also accept a Bachelor's degree or foreign equiv. plus 5 yrs of progressively exp. Salary \$73,000/yr. Send resume to: Teri Allen, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606.



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Software Consulting Engineer. Job location: Indianapolis, IN. Duties: Analyze, design, develop, architect, administer, install, configure complex comp. systems and applications that are package software, e-business and e-commerce related that add business value to the clients. Analyze, technical problems, operational and performance tuning requirements & resolve technical issues. Work involves extensive systems analysis. Configure and administer web servers, application servers and database servers. Provide support in Unix and NT systems administration. Test and implement customized client/server software applications for business clients using the Oracle relational database technologies and the Oracle Forms and Reports, SQL Loader and PL/SQL development tools. Requires M.S. in Electronics/Commercial Engineering, Comp or Info. Science or a related field plus 3 yrs exp. in the job offered or 3 yrs exp. as a Sr. Technical Consultant or Consulting Analyst. Exp. which may have been obtained concurrently, must include: 2 yrs of exp. in database administration utilizing Oracle 8i/8.1.7.x and at least 1 yr of exp. utilizing one of the following technologies: Bachman, System Architect, Erwin, Sdesinger, ADW or IEF. Exp. must also include administering ERP applications. Salary: \$80,000/yr. Send resume to: Ten Allen, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606.

Technical Support Analyst. Systems support, systems administration and help desk functions. Operating system to be supported is the UNIX operating system on Hewlett-Packard and IBM machines. Monitoring system up time and system performance ranging from disk usage, cpu usage, print queues, adding/changing/deleting file system, monitor software. Adding/deleting users and changing privileges on UNIX security system. Use of UNIX utilities including FTP, Ping and Telnet. Use of programming languages including Sed, Awk, Tcl/Tk, Perl and UNIX protocols such as TCP/IP and networks including Ethernet/TOKEN Ring, Kron, Csh and Tach shell programming. Troubleshooting X-Windows stations and terminals and automating batch processes through Shell script programming. Require Bachelor's degree in Computer Science and must have taken courses or worked on projects using UNIX Operating System, X-Windows, Awk, Tcl/Tk, Perl and networks systems, including the TCP/IP environment. Applicants must show proof of legal authority to work in the U.S. Apply to Illinois Department of Employment Security, 401 S. State Street, 7 North, Chicago, Illinois 60605, attention: Leonard Boksa. Reference VIL23562-B. An Employer Paid Ad. No Calls. Send 2 copies of both resume & cover letter.

Senior Application Analyst wanted by Co mfg garage door openers in Elmhurst, IL. Must have Bach in Comp Sci & 3 yrs exp in distribution & financial application with AS/400 envrmt. Respond to: HR Dept., AS/400, The Chamberlain Group, Inc., 845 Larch Ave, Elmhurst, IL 60126

Manager-SAP Analysis. Job Location: Independence, OH. Duties: Manage the system setup and implementation of SAP R/3 software packages. Analyze client's business requirements and translate into specific system configuration and implementation plan using SAP R/3 enterprise software package. Define functional enhancements to SAP R/3 to enable all business requirements to be supported by software. Responsible for monitoring version levels and coordinating upgrades of interfaces and base SAP system. Requires B.S. or foreign equivalent in Comp. Or Info. Sci., Eng. or related field plus 4 yrs exp. in the job offered or 4 yrs exp. as a Team Leader, Sr. Software Eng. Exp. which may have been obtained concurrently, must include: 2 yrs exp. configuring systems using SAP R/3 and 2 yrs exp. managing system set-up and implementation of SAP R/3 software packages. Salary: \$120,000/yr. Send resume to: Ten Allen, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606.

Web Developer needed for West Central Illinois location with B.S. in one of the following: Computer Science or Electronics Engineering, plus 1 year experience as a Systems Programmer. \$70K per year, 8:00 am - 5:00 pm, 40 hrs/wk. Consult with client companies to determine user requirements. Develop specifications, analyze, test, implement & document computer applications. Convert specifications into detailed instructions for coding. Evaluate user requests for new & modified programs; formulate plans and convert specifications for coding using C, C++, Java, Java Servlets, HTML, Shell Perl & CGI. Applicants must show proof of legal authority to work in the U.S. Send resume to Illinois Dept. of Employment Security, 401 S. State St., 7 North, Chicago, IL 60605. Attention: Lenia Jackson. Reference #V-IL 22002-J. An employer paid ad, no calls - Send 2 copies of both resume & cover letter.

SYSTEMS ENGINEER. Research, design and develop computer software systems, in conjunction with hardware product requirements, applying principles and techniques of computer science, engineering and mathematical analysis. Analyze software requirements to determine design feasibility. Requires a bachelors degree in Electrical Engineering/Mechanical Engineering or equivalent degree. Requires a minimum of five years experience in the job offered or as a software engineer or systems analyst. 40 hours per week, salary \$55,000.00 per year. Applicants should send resumes with social security numbers to the Indiana Department of Workforce Development, 10 North Senate Avenue, Indianapolis, IN 46204-2277. Attention: DPG. Applicants must refer to I.D.# 8078728 when submitting resumes to the Indiana Workforce Development office.

Research Engineer wanted by Pump Mfg Co in Houston, TX. Must have BS in Computer Studies & 3 yrs exp. Respond to: HR Dept, Farouk Saleh, O'Drill Pump & Valve Mfg Co, 9217 Summer Bell Lane, Houston, TX 77074

## NETWORK ADMINISTRATORS

Candidates must possess a Bachelor's degree in computer science or business administration/other technical degree with minor in information systems. Responsible for maintaining and coordinating operation of local and wide area networks and related hardware and software as well as providing internal support for telecommunications systems (PBX and voicemail systems). Send resume w/cover letter to Paul Antor, Business Development Manager, Rapidparts, Inc., 2474 Turner Ave NW, Grand Rapids, MI 49544.

Database Analyst (multiple positions) (Midlevel). Oracle database design & administration. Develop packages, procedures & functions in SQL/PLSQL. Create Shell scripts in UNIX. Evaluate interface b/w hardware/software & operational performance of systems. REQ'D: MS or equivalent experience in job offered. Salary low 60's. Send resumes to: Chapman Steel, 300 Ward Rd, Midlothian, TX 76065. Attn: Sandy Harrison.

SAP Senior Basis Consultant Experienced in all phases of system development life cycles, including ASAP methodology. Must reside in Chicago area to provide 7x24 support to client. In-depth technical knowledge of UNIX/Oracle platforms, SAP R/3 versions 3.0F, 4.0B and 4.6B; SAP R/3 Banking version 4.01C; SAP BW version 1.2B and SAP communications using ALE. Respond by resume to: Jocelyn Freimark Symmetry Corporation Fax: 414-274-3111 E-mail: [joc@sym-corp.com](mailto:joc@sym-corp.com)

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**SCS America (BrightStar) is searching for SAP analysts with the following requirements:** SAP experience in FI, CO, AM, PS, HR, SD, MM, WM, PP, QM, SM, Basis or Abap 4. Also looking for Business Analysts and J.D. Edwards Functional Consultants. Positions available throughout the U.S. Extensive travel and possible relocation involved. Send resumes to: BrightStar IT Group, 950 Tower Lane, Suite #1750, Foster City, CA 94044 or e-mail to: resumes@brightstar.com

**Sr. Database Administrator.** Design, test, build, and implement Oracle-based 24x7 high availability replicated database environment for online sweepstakes system and related management systems software. Requires a B.S. or equivalent work experience plus 3 years experience. Send resume to: Bernard Gallet, Luckysurf.com, 295 Oyster Point Road, Burlingame, CA 94080.

**Full time Sr Consultants and Software Consultants** needed for a computer software development and consulting company. Bachelor's degree in the computer industry and experience required. Salary varies per position. Please send resume to IStream, Inc. 3103 Bee Caves Road, Suite 105, Austin, Texas 78746. Attn: Steve Denton.

**Software Engineer** sought by IT consulting company in Vennia, VA to work in Colorado Springs, CO, to engage in full life-cycle software development in an IBM mainframe environment. The software applications run on an MVS/ESA operating system, & incorporate DB2 & ADABAS databases. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications. Use COBOL programming language & CICS & Endeavor development tools in the design & development process. Requires Bachelor's or foreign equivalent in Computer Science, Engineering, or related field; 2 yrs software programming experience; Working knowledge of IBM mainframe software development, including ADABAS database & the Endeavor development tool. \$66,100/yr; M-F, 8am-5pm. Respond by resume to: James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4672373.

**PROGRAMMER/ANALYST DATABASE ANALYST**  
Offshore Digital Services seeking candidates with commercial experience in the areas listed below:  
• programmer/analysts and application programmers with 2-7 years commercial experience. Candidate should have a BS (or foreign equivalent) in Computer Science or a related field.  
• database analysts and developers with minimum 3 years commercial experience. Candidate should have an MS (or foreign equivalent) in Computer Science or a related field.  
Full time permanent positions are available in the San Francisco Bay area, and nationwide.  
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The Personal Manager Offshore Digital Services, Inc.  
14798 Wicks Boulevard San Leandro, CA 94577  
Fax: 510-463-1819 Email: personnel@ods.com

**Senior Technical Consultant** sought by company in Denver, CO specializing in business software solutions to work in Atlanta, GA & other unanticipated job sites in the US. Manage implementation, integration, & customization of client/server enterprise resource planning software applications. The software applications run on Windows NT & UNIX platforms, & interface with different relational database management systems, including Oracle, Sybase, & SQL Server. The projects involve business process modeling, optimization & re-engineering. Create software designs & design documentation, & work with the software engineers to custom & implement software applications & plan direction of future releases. Requires Bachelor's in computer science, engineering, or related field (including management engineering); 2 yrs. experience as a technical consultant implementing & customizing enterprise resource planning software applications that run on Windows NT & UNIX platforms, & interface with relational database management systems, including engaging in business process modeling, optimization & re-engineering. \$66,000/yr. (2 openings.) Respond by resume to: James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO4670863.

**Software Engineer (2 positions)** – Researches, designs and develops computer software systems in conjunction with hardware product development applying principles and techniques of computer science, engineering and mathematical analysis. Requires Master in Computer Science, Electronic or Electrical Engineering or Mathematics. Requires 2 yrs experience in job offered or 2 yrs experience as Systems Analyst, Systems Engineer or Programmer Analyst. Must have one-year experience using OLAP. 5 day, 40 hr/wk, \$66,100/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO4667817.

**Data Base Design Analyst (2 Positions)** – Design logical and physical data bases and coordinates data base development as part of project team, applying knowledge of data base design standards and data base management system. Requires 3 yrs experience in the job offered or 3 yrs experience as Systems Analyst, Software Engineer or Programmer Analyst. Must have 1 year experience in Oracle Developer 2000. 5 day, 40 hr/wk, \$62,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO4669617.

**Internet/Intranet Applications Developer** wanted by Inter/intranet multimedia solutions providers in Boulder, CO. Must have BS in Computers & 1 yr. exp. creating ASP, JAVA, HTML, applications integrated w/Microsoft, SQL databases to provide dynamic content. Respond to: H.R. Dept., Digital Creators, 4865 Sterling Dr. #100, Boulder, CO 80301.

**Sr. Designer.** Job location: Cupertino, CA. Duties: Develop creative designs to meet clients' goals, satisfy branding requirements, communicate info, architecture and enhance user exp. Develop web site interface & interactive advertising & traditional communications media. Lead creative design tasks & lead large-scale internet & multimedia design projects. Develop original concepts & designs according to specifications. Present concepts to creative team. Provide support to client presentations. Respond to client feedback with design recommendations. Refine & ensure production of designs, developed to meet client needs. Execute design to define project objectives. Utilize Adobe Photoshop, Illustrator, Macromedia Dreamweaver, Flash & other multimedia authoring tools to develop concepts & designs. Requires: M.F.A. in Graphic Design/Computer Graphics or closely related field. Coursework must include classes in: (1) branding & marketing principles for the internet, & (2) general principles of web graphics, user interface design & internet implementation. Salary: \$68,000/yr. Send resume to: Teni Allen, marchFIRST, Inc., 311 S. Wacker Drive, Chicago, IL 60606.

**Computer Programmer(s)**  
Multiple Openings req. by Website Design Technical Consulting Co. specializing in web design development, in Santa Fe Springs, CA. Must have Bachelors Degree in Computer Science or any relevant engg field. Respond to: James Chen, President, eServiceOffice, Inc. 12155, Mora Drive, Santa Fe Springs, CA 90670.

**Sub: Systems Analyst I & II**  
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**Qualifications:**  
System Analyst I job candidates must have at least one year experience in computer programming applications, including systems analysis and design. Systems Analyst II applicants need two years experience in computer programming application comparable to that of a Systems Analyst I. Both positions require a BA with major coursework in Computer Science or a closely related field, and a valid CDL with a good driving record. Extensive knowledge of computer systems analysis and information systems concepts and operating principles essential.

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**Human Resources Dept.**  
City of San Mateo  
330 W. 20th Ave.  
San Mateo CA 94403

For more info, call the City of San Mateo's JOB HOTLINE: (650) 522-7777, ext. #24, or visit our website at [www.ci.sanmateo.ca.us](http://www.ci.sanmateo.ca.us).



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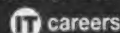
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**Project Manager/Director**. Identify, market and deliver information technology solutions for marketing, recruiting and delivery teams. Plan, direct and coordinate activities of designated project to ensure goals and objectives of project are met. Demonstrated ability identifying technical resources in the information technology field and sourcing them globally through effective recruitment programs. Demonstrated ability managing client relationships and overseeing delivery of information technology services through multiple channels. Demonstrated ability identifying clients for company's information technology services offerings and formulating a strategy for selling in the market. \$80,000/yr. 40 hrs/week, 9 a.m. to 5 p.m. Must have 5 yrs. exp. for 5 yrs. exp. in related occupation of Manager/Product Executive and M.B.A. in Business Administration rel. field/req. Send 2 resumes: Case #2001963, Labor Exchange Office, 19 Stanford Street, 1st Fl., Boston, MA 02114.

**Software Engineer** Atlanta, GA opening to design, analyze, develop, customize, implement & upgrade PeopleSoft HRMS & Financial Applications using People Tools, PeopleCode, SQL, Unix, Windows NT, Oracle & Batch Processing Applications. Design & develop Complex reports, interfaces to External Vendors using SQL, Crystal Reports, P/S/Query & Unix Shells. Help users w/functional aspect of various modules like HR Benefits, Payroll, AP, PO, GL, AR & other HRMS & Financial Modules. Req. M.S. in CS or other related field w/1-yr. exp. in job offered. Resume to: HR Manager, SoftTech, Inc. 8282 Western Way Cir., Ste 1110, Jacksonville, FL 32256.

**SENIOR PROGRAMMER / ANALYST** to analyze, design, develop, test, implement and maintain software for various applications using C, Java, JavaScript, HTML, Visual Basic, Lotus Notes, and Lotus Domino in a client/server environment under Windows95/NT and UNIX operating systems. Require B.S. degree in Computer Science/Engineering, or a closely related field, with two years of experience in the job offered or as a Programmer/Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$66,000/year; 8:00 am to 5:00 pm M-F. Send resume to: Pithu Hansen, President, Focus Software, Inc., 22 Perimeter Center East, Suite 2205, Atlanta, GA 30346; Attn: Job DN.

**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Java, Oracle and C++. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer; knowledge of Java, Oracle and C++. Salary: \$84,860/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. James J. Macklin, Beaver Falls Job Center/PCCL, 2103 Ninth Ave., Beaver Falls, PA 15010-3957; Job No. WEB114250.

**PROGRAMMER/ANALYST** to analyze, design, develop, test, implement and maintain software for various business applications using object oriented programming, C++, SQL, PL/SQL, Oracle, Oracle Applications, Developer/Designer 2000, Java J Developer, AWK, HTML, under Windows, Unix, and DOS operating systems. Require B.S. degree in Computer Science, an Engineering discipline, or a closely related field. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$66,000 per year; 8 am to 5 pm, M-F. Send resume to: Ray Kandamala, President, Everest Computers, Inc., 875 Old Roswell Rd., Suite E 400, Roswell, GA 30076; Attn: Job RN.

**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in ASP, Visual Basic, and SQL Server. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer; knowledge ASP, Visual Basic, and SQL Server. Salary: \$95,574/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Anthony Gebala, Westwood County CareerLink, 300 East Hillis Street, Youngwood, PA 15697-1808; Job No. WEB114269.

**COMSYS** is an established IT consulting firm that serves leading corporations including 174 of the Fortune 500. With COMSYS, you get: Extensive Benefits, Additional Compensation for referrals, and Professional Challenges with training and assignments to keep you at the forefront of technology. With over 30 offices, we need the services of experienced consultants across the US.

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**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Java, JavaScript and C++. Requirements: Master's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer; knowledge of Java, JavaScript and C++. Salary: \$72,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Thomas Dembosky, Indiana Job Center, 350 North Fourth Street, Indiana, PA 15701-2000; Job No. WEB114305.

**Senior Systems Analyst**. Analysis, design & implementation of software applications. Database review & design for data conversion. Tools: Windows, UNIX, COBOL, IBM Mainframe, LAN, BS, in Comp. Sci., Electrical Eng., Math or Physics + 5 yrs exp in job offered or as Programmer or Systems Analyst required. Previous exp. must include: Windows, COBOL, UNIX, "3 yrs of in related study + 1 yr exp as a programmer also acceptable. 40 hrs/wk, 9am-5pm, \$64,800/yr. Applicants must show proof of legal authority to work in the U.S. Send two copies of both resumes and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street, 7 North, Chicago, IL 60605; Attn: Joanne Breau; Reference #VIL-23117-N. NO CALLS. An Employer Paid Ad.

**SENIOR SOFTWARE ENGINEER** to design, develop, test, implement and maintain business applications tools and management information systems for various industries using PowerBuilder, Java, JavaScript, HTML, Visual Basic, VB Script, Lotus Domino and Lotus Script in a client/server environment under Windows95/NT operating systems. Require Master's degree in Computer Science, Information Systems, Business Administration, or closely related field, with two years of experience in the job offered or as a Programmer/Analyst. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$68,000/year; 8:00 am to 5:00 pm M-F. Send resume to: Pithu Hansen, President, Focus Software, Inc., 22 Perimeter Center East, Suite 2205, Atlanta, GA 30346; Attn: Job AB.

**Systems Analyst**. Plan, develop, analyze, modify & document computer programs; design databases, using MS SQL Server 6.5/7.0; code programs using tools like Visual Basic 6.0, Frontpage, Visual Interdev, IIS; develop Web pages on active server using JavaScript, Vbscript; conduct unit testing & application implementation. Req BS in CS, or other related discipline + 2-yr exp. in job described. Resume to: HR Director, Enterprises Computing Services, Inc., 8744 Main St., Ste. 101, Woodstock, MA 03086.

**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in DB2, CICS, VS COBOL II and Expeditior. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and five years experience as a software engineer or computer programmer; knowledge of DB2, CICS, VS COBOL II and Expeditior. Salary: \$69,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Mary Pat Curran, McKeesport/Allegheny Co. CareerLink, 345 Fifth Ave., McKeesport, PA 15132-2600; Job No. WEB114264.

**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Java, JavaScript, C++ and Oracle. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer; knowledge of Java, JavaScript, C++ and Oracle. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Joseph Stralica, Pittsburgh/Allegheny Co. CareerLink, 425 Sixth Ave., Suite 2200, Pittsburgh, PA 15219; Job No. WEB114256.

**SOFTWARE ENGINEER**. Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Java, JavaScript, C++ and Oracle. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and one year experience as a software engineer or computer programmer; knowledge of Java, JavaScript, C++ and Oracle. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Sue Nataricola, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513; Job No. WEB114107.

**Sr. Programmer Analyst**. Design, develop and implement software applications on multiple platforms and environments using IBM mainframe, Cobol, IMS DB/DC, DB2, CICS, TSO/ISPF. Design, develop, test, document and implement software application systems, program specifications, flowcharts and system test plans. Demonstrated ability working with Cobol, CICS, DB2, IBM 3090, \$60,000/yr. 40 hrs/wk, 9 am - 5 pm. Must have 2 years exp. (or 2 yrs exp. in related occupation of Programmer Analyst) and B.S. in Comp. Sci., Eng. rel. field/req. Send 2 resumes: Case #20001584, Labor Exchange Office, 19 Stanford St., 1st Floor, Boston, MA 02114.

**Senior Developer** position with brokerage/investment banking firm performing object oriented systems and database development using C/C++, UNIX, Oracle, CORBA. Must have advanced level experience as evidenced by Master's degree plus 1 yr exp in offered job duties, or Bachelor's degree plus 5 yrs in offered job duties. Must have at least 1 yr systems development exp with brokerage firm. M-F, 9am - 5pm; \$105,000/yr. Employer paid ad. Send resume to: Div of Employment & Training, ATTN: Ref # 20000178, 19 Stanford Street, Govt Ctr, Boston, MA 02114.

Dallas based IT Co. has multiple openings for Programmer/Analysts and Software Engineers. Please send a resume, with salary history & requirements to: Information Knowledge Group, Inc., Attn: Human Resources, 17440 N. Dallas Parkway, Suite 262, Dallas, TX 75287

Director of Applications Development - Global Transfer & International Services to direct the computer systems function for large international company. Manage software developers & analysts in multiple sites for global business. Respond to Human Resources, attention MHS-FTT, Franklin Resources, Inc., 777 Mariners Island Blvd., San Mateo, CA 94404

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**SOFTWARE ENGINEER** to design, develop, test, implement and maintain internet/intranet application software using object-oriented programming, C++, Visual Basic, Visual C++, Java, JavaScript, Perl, Shell, CGI scripting, socket programming, RDBMS and MS Access in a client/server environment on UNIX and Windows NT operating systems. Provide technical support in database design and computer graphics technologies. Requires: M.S. degree in Computer Science. Must have a demonstrated ability to perform the stated duties gained through previous work experience / academic coursework and projects. M.S.C.S. coursework must have included one course each in computer graphics and database design. Salary: \$65,500 per year, 9:00 am to 6:00 pm, M-F. Apply by resume to: Kristina Uveling, Human Resources, Marquand Communications, 1800 Peachtree St., NW, Suite 250, Atlanta, GA 30309-2517. Attn: Job YK

**PSC2000 INC.**, a Maine IT co., is looking to fill the following positions at their work sites:

**Software engineer/programmer** analyst - bachelors degree, engineering (any), math, science, and two years of experience in the job or five years exp in the job. Exp in the following skills preferred: VB, VisualAge, DB2, JAVA, Visualworks, ORACLE, UNIX, WindowsNT, Smalltalk, VC++, VisualBasic, C++, C, DB2, ADSO, IDMS etc.

**Systems Admin - Bachelors** degree in engineering (any), math, science and 2 years on job or five years on job total experience. Exp in the following skill preferred: NT admin, LAN/WAN, HP/SUN/UNIX Administration, Lotus admin, TCP/IP, OPEN VIEW Shell program etc.

Send Resumes to:  
PSC2000 INC  
634-MAIN ST  
SO PORTLAND, ME-04106

**SYSTEMS ENGINEER** (Lions, MI) to analyze data processing requirements of client, and plan layout and installation of new system or modification of existing system operating under the Microsoft Windows 95/98/NT environment. Provide user support and training on company's software products and systems. Responsible for testing and roll-out of new software products. Detect and solve software, systems, and hardware issues. Requires: Bachelor's degree in Computer Science, Engineering, or a closely related field with demonstrated ability to perform the stated duties gained through previous work experience/academic coursework and projects. Extensive travel on assignment to various company and client sites within the U.S. is required. Must be a Microsoft Certified Systems Engineer. Salary: \$42,193.80 am to 5:00 pm M-F. Send resume to: Elizabeth Haney, Assistant VP, MYND, One MYND Center (Int. 01-177 & US 21N), Blythewood, SC 29016, Attn: Job MS.

**SOFTWARE ENGINEER** Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Visual Basic, Crystal Reports, SQL Server and ColdFusion. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and one year experience as a software engineer or computer programmer, knowledge of Visual Basic, Crystal Reports, SQL Server and ColdFusion. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply to: Terrance Kinney, Armstrong County Team PA CareerLink, 1270 North Water Street, PO Box 759, Kittanning, PA 16201-0759, Job No. WEB114115.

**COMPUTER PROFESSIONALS:**

Adjust Object Computing, Inc. is a computer consultancy company. We are looking for software professionals possessing consulting experience in the following skills or a combination thereof:

Smalltalk (VisualWorks and/or VisualAge) Primg Language and ENVY Manager configuration management tool.

All positions require BS/MS degree and 1-2 years of experience in creating applications using object oriented methodologies and techniques. Very strong interpersonal and team development skills desired. Must be willing to travel to client sites. We offer competitive salaries and benefits. For immediate consideration please send resumes to: Adjust Object Computing, Inc., 514 Daniels Lane, Suite 412, Raleigh, NC 27605; Fax: (919) 836-1545; Phone: (919) 836-8212 or Email: dcamp@adjustinc.com. EOE. M/F/V. Visit our Website at www.adjustinc.com

**IT Professionals**

AT&T has multiple openings (all levels) in information technology fields. Positions include: Software Engineers, Systems Analysts, Network Engineers, Web Masters, Database Administrators, Researchers, Technical Managers, and other IT positions. Openings nationwide including California, North-Central New Jersey, New York, Florida, Colorado, Georgia, N. Carolina, Ohio, Pennsylvania, Texas, and Virginia. Some positions require a Bachelor's degree, some a Master's, others a Ph.D. Some require experience, others are entry level. Interested candidates should apply online at: www.att.com/it, use keywords IT Professionals, indicating location preference, and salary requirements; or mail resume with cover letter to: AT&T, Attn: Human Resources, 429 Ridge Rd., Dayton, OH 45401. AT&T is an Equal Opportunity Employer. We welcome and encourage diversity in the workplace.

**PROGRAMMERS NATIONWIDE**

We are looking for individuals with exp. in:  
• Visual Basic, ASP, COBOL, C++, VC++, PowerBuilder, C++, UNIX, SAS  
• Oracle, Sybase, Informix, Access (Developer & DBAs)  
• Oracle Financials & Manufacturing  
• JAVA/HTML/CGI, COBRA, PERL  
• NT Admin, Networking Professionals  
• Sales & Marketing Executives & Technical Recruiters  
All positions require good interpersonal skills. We offer competitive salaries & full benefits package. Forward your resume to:

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505 Thornhill St., Suite 205  
Edison, NJ 08837  
Tel: 732-744-0134  
Fax: 732-744-0135  
Email: recruit@savantinc.com  
Visit us at www.savantinc.com

**Senior Systems Analyst** Senior Systems Analyst wanted by Computer Consultancy Company. This position will work in various locations throughout the U.S. Position requires a Baccalaureate Degree in Computer Science or related field and five (5) years experience in IT programming and analysis. At least three years experience with systems analysis and problem solving, working on major systems utilizing technical skills (such as VFP, LING, CLITE, DM/INQUIRY, CANDE and ERGO) to support applications written in COBOL, LING, Microsoft COBOL, Visual Basic and SQL. Knowledge of UNIX and Windows environments and relational database including Microsoft Access is needed. Respond to HR Dept., Jui Corporation, 314 Commons Way, Princeton, NJ 08540. An Equal Opportunity Employer

**ASSOCIATE TECHNICAL CONSULTANT** (Dallas, TX) to assist in a lead technical role to design, develop, implement and support application software for life insurance systems on mainframes using Cobol II, Assembler, JCL, VSAM, CICS, ABEND-AID, TSO/SPF/ISPF, XEPEEDITOR, MS PROJECT, COMPAREX, DASD, DUMP/MASTER, and IDCAMS. Code, test and debug using Cobol II and Assembler. Participate in high-level design sessions, write technical programming and design specifications, mentor less experienced team members. Requires: Bachelor's degree (or equivalent) in Computer Science, an Engineering discipline, or a closely related field with five years experience in the job offered or in the related occupations of Systems Programmer/Analyst. Each three years of progressively responsible experience in the field will be considered equivalent to an additional year of college/university education. At least one year of experience must have been in life insurance systems. Spontaneous and irregular travel to client sites is required. Salary: \$65,000/year; 8:15 am to 5:15 pm M-F. Send resume to: Elizabeth Haney, Assistant VP Policy Management Systems Corporation (d/b/a MYND), One MYND Center (Int. 01-177 & US 21N), Blythewood, SC 29016, Attn: Job AM.

**Systems Analyst** Perl all aspects of application development, including analysis, design, construction, testing, and implementation. Prov work estimates and schedules. Perform ongoing support activities for production systems such as user support and modifications to the application. Analyze user requirements, procedures, and problems to automate processing or to improve existing computer system. Prep workflow charts and diagrams to specify in detail operations to be performed by personnel in system. Conduct studies pertaining to dev of new information systems to meet current and projected needs. Upgrade system and correct errors to maintain system implementation. Req. a Bachelors in Mathematics or Computer Science and 1 yr of exp in computer consulting or software consulting. 40 hrs./wk. Wage is \$54,600/yr. Apply at the Texas Workforce Commission, Houston, Texas or send resume & ad to 1117 Trinity, Room 424T, Austin, TX 78701. Fax: 737-781-1000. TX1006440. Ad paid by an Equal Opportunity Employer.

**SOFTWARE ENGINEERS** needed to analyze, design and develop applications software, system interfaces and relational databases for SAP and Oracle on Windows NT and UNIX platforms. Master's required in Math, Computers, Engineering or any other related field of study, plus 6 months of experience. Must have proof of legal authority to work in the U.S. Salary: \$67,000/year for a 40 hour work week. Interested applicants submit resume or C.V. to The Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila., PA 19123. Refer to Job Order #9110358. Ad paid by An Equal Opportunity Employer.

**Consultants**

Software AG Inc. is one of the largest systems software companies worldwide. We are a premier provider of integration technology. We also specialize in the recruitment and placement of consulting software development staff. We need consultants (Programmer Analysts to Systems Analysts) with the following skills:

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**Programmer Analyst** Travel to various client sites nationwide to design, develop, implement, analyze, and modify sophisticated customized software systems. Confer with clients in analyzing operational software procedures, requirements, and products to improve existing software computer systems. Identify and resolve system-specific issues. Design and modify computer software systems and functional specifications as required for various modules. Implement software design changes according to client objectives. Create user documentation requirements, generic user documentation for use by end-users, and module application systems testing methodology. Provide high-level technical advice and training on-site Systems Analysts, Programmers, and professional computer staff, and document assigned phases of each aspect of software design. Requirements: Bachelor degree in Computer Science, Mathematics, Engineering, or related field. Must have two years of programming experience in Oracle Manufacturing and/or Oracle Applications development using SQL, PL/SQL, 3/4-5, 40 hrs/wk., Mon-Fri, 8am-5pm, \$85,000/yr. Job Order #NC7231568, DOT Code 080.162-014. Applicants should apply at nearest Job Service office or submit resume to: Job Service, 700 Wade Avenue, P.O. Box 27227, Raleigh, NC 27611. All resumes must include applicant's Social Security number.

**SALES ENGINEER**

Sells computer software and consulting services requiring knowledge of software engineering and cost effectiveness. Calls on management representatives, such as engineers or other professional and technical personnel at commercial, industrial, and other establishments in attempt to convince prospective client of desirability and practicality of products and services offered. Reviews customer documents to develop and prepare cost estimates or projected increases in productivity from client's use of proposed software or services. Draws up or proposes changes in equipment, processes, or use of services which would result in cost reduction or improvement in operations. Provides technical services to clients relating to use, operation, and maintenance of software. Draws up sales or service contract for software products or services. Provides technical training to employees of client.

Candidate must have a Master of Science degree in Computer Science, Engineering, Math or academic equivalent and 3 years experience as a sales engineer. A Bachelor of Science in Computer Science, Engineering, Math or academic equivalent plus 5 years experience as a technical sales manager will substitute for Master's degree and 3 years of such experience.

The hours are 8:00 a.m. until 5:00 p.m. The rate of pay is \$60,000.00 per year.

If interested, please submit a resume and letter of interest to Helen Gallagher, Human Resource Director, Vector Consulting, Inc., 5707 Peachtree Parkway, Suite 400, Norcross, GA 30092-2814.

Following software positions available for experienced IT professionals for an Atlanta, GA based consulting firm:

a) 3 AS/400 COBOL, RPG professionals with programming on commercial applications, expertise on methodologies using IEF, SUBVEPLUR and development tools such as Implementer and Hawkeye. Also 2 candidates with experience on J.D. Edwards 7.3 sales and distribution modules, financials and conversion experience using INSURE/90 required.

b) 2 positions for Oracle Developer and DBA, Oracle Workgroup server, Oracle Enterprise, Developer 2000, ERWIN on HP, UNIX and Win NT platforms.

c) 1 Strong SYBASE DBA and developer with at least two years on Power Builder. Other skills needed for this position include SCO UNIX and SV/4 open system installation, management and routine administration experience, MF-COBOL and Visual Basic programming.

Minimum salary \$58000/year. Send resume to Bell USA Inc, 3253 Satellite Blvd., Bldg 400 Suite 300, Duluth GA 30096.

**INFORMATION TECHNOLOGY OPPORTUNITIES**



The Gillette Company is the world leader in more than a dozen consumer product categories. Global World Class operations are increasingly dependent on Information Technology. Exciting opportunities exist in global business process integration initiatives. We are currently seeking the following highly qualified professionals to join the Gillette IT team in the Boston area.

The following positions (unless otherwise noted) all require a Bachelor's degree (or equivalent) in Computer Science, MS, Business Admin., or similarly relevant field, and 3-5 years relevant experience to include the requirements described below:

- Senior Staff Programmer Analyst with 5 years business systems programming experience, 3 years of which involved SAP ABAP development, with design and QA expertise, and SQL/relational databases. [Job Code #: MSP-DL-1C-P]
- (SAP) Staff Basis Administrator with 3 years IT experience defining requirements and maintaining SAP Basis infrastructure, with SAP remote printing, HP-UX, and EMC hardware/software. [Job Code #: MSP-DL-100008CP]
- Senior Telecommunications Analyst with Associate's degree, 3 years experience in design and implementation of multi-carrier global networks using Cisco hardware and software. [Job Code #: MSP-DR]

Starting salaries range from \$53,700 to \$96,400 per year, together with paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits. The Gillette Company, Prudential Tower Building, Human Resources (Mailstop: JM-MSP), Boston, MA 02199. Email: JM\_MSP@Gillette.Com. The Gillette Company is an equal employment opportunity employer.

**NeuVis Inc.** electronic commerce specialists, is seeking experienced Systems Analysts, Software Engineers, and Software Engineer-Project Managers to provide computer based solution to clients seeking to integrate diverse computer information systems.

**Software Engineers**

Qualified applicants will have MS in Comp Sci/Math/Eng or a rel. disc. or BS in Comp Sci/Math/Eng or a rel. disc. & 5 yrs. prog. exp. in a software design/development occup. Must have exp. w/Windows NT, Sun Solaris, UNIX, Java, ORACLE, SQL, and Visual Basic.

**Systems Analysts**

Qualified applicants will have a BS in Comp Sci/Math/Eng or a rel. disc. & 2 yrs of exp in the job offered or 2 yrs exp as a programmer/analyst, software engineer or in a related occupation as well as exp w/ C, C++, UNIX, Windows NT, SQL, Sybase & Oracle.

**Software Engineer / Project Manager**

Qualified applicants will have Master's degree in Business Management or Business rel. disc. & 2 yrs exp in job offered or 2 yrs exp in an occupation involving client/server maint. Must have experience w/Windows NT, Sun Solaris, UNIX, Java, ORACLE, SQL, and SEI/COM framework.

Please send resume to: NeuVis Inc. Ref. Code: AEMGC. Human Resources, 2 Trap Falls Rd., Shelton, CT 06484.

**Programmer Analyst - SAP Specialist.** Structured systems analysis, process eng'g, design, configuration, prototyping, dev't/mnt, testing, QA, implementation, integration, maintenance & knowledge transfer of SAP R/2 & SAP R/3 systems for business, finct., banking, Mfg. & other commercial application systems in a multi-hardware environ. using centralized or distributed Relational Database Mgmt Systems (RDBMS), Fourth Generation Languages (4GLs) & ev'ng. (Graphical User Interface) front-end tools. Req. B.S. in comp. sci., sci. or eng'ng/rtr (or equiv.) & 1 yr exp in job offered or as programmer/analyst/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 2 of A & 1 of B; or 2 of A or 2 of B. A includes FI, CO, AM, SD, MM, PP, OM, PM, HR, PS, WF, IS, BS; B includes ABAP/4, Screen Painter, Menu Painter, SAP Script, Correction/Transport, Data Dictionary, Function Modules, User-Exit Routines, SAP Installation, High mobility preferred. (Multiple positions) 40 hrs/wk. \$53,000-\$68,000. Report/subml resume to Barbara Cole, Greene County Team PA CareerLink, 4 West High Street, Waynesburg, PA 15370-1324, Web 114314.

**GROUP INFO MGT. MANAGER (SAP)**

**POLAROID CORPORATION**, a global leader in instant imaging research, technology and products, has a need to fill a **Group Information Management Manager (SAP)** position. This Boston-area position will be responsible for leading the design and implementation of global business processes and SAP integrated software.

- Requirements include a Bachelor's degree in CS, Math, EE, or similar field, and eight (8) years experience involving the design, development, implementation support of enterprise-wide, multi-functional information technology systems.
- Salary ranges from \$87,768-\$107,040, with two weeks paid vacation, medical insurance, and other industry competitive benefits.

Respond with resume only to: Ms. Natalie Perry, Manager HR, Global Resource Mgt., Polaroid Corp., 920 Winter St., (R1-1), Waltham, MA 02451, Fax: (781) 396-9540. Email: natperry@polaroid.com. Polaroid is an EOE-M/F/D/V/SO.



# Hot Skills: JAVA

The language of business may be English, Japanese, German, Spanish, Chinese or French, but the language of the web is Java. As traditional corporations and entirely new e-economy businesses turn to the Internet as the basis of exchanging money and materials, Java has gained prominence as the hottest of the hot skills in a flaming market for talented people.

## Amazon.com Seattle, WA

Java skills are fueling many projects at Amazon.com, from software used to manage the business to enabling Amazon.com's newest offering, buy/sell exchanges. "We are using software to do things that have never been done before," explains Al Vermeulen, director of platform services. "Almost as exciting as the projects is the speed at which we run - we spend just a few months on every project because we have to get it up and working."

Vermeulen is looking for people with language and design skills. "Most important, we are looking for people who continuously learn and who have the ability to deliver," he says. "We need that passion for getting something done that accomplishes a business goal."

The business views its one limiting factor as its ability to build software quickly. "That means people," says Vermeulen. "We empower developers with tools, and they have to take off."

"We believe the pace and the absolute technology edge of what we are doing are key to attracting people," adds Vermeulen. "We also know the biggest reason people stay here is because of the people who are here. Throughout Amazon.com, you have the opportunity to work with smart people. We are building an ownership culture, based on owning stock, but also on acting and feeling like an owner. The company isn't a third person, it's us."

Vermeulen admits there's another reason he joined Amazon.com. "We are part of history in what we are doing here," he says. "Amazon.com has driven what e-commerce is becoming. In 10 years, we'll be able to look back, ask ourselves how did we do that, and then know that we were part of creating something entirely new."

## CoolSavings.com Chicago, IL

CoolSavings has a simple business model - bring together consumers interested in saving with advertisers who offer discounts. The advertisers pay to participate on CoolSavings.com with targeted savings offers to CoolSavings' more than 8.7 million members.

"Keeping up with growth has been one of our biggest challenges," says Joe Henson, manager of development. "It's a good problem to have - sifting through new opportunities and nailing down those that have the best opportunity and determining what is required to make them happen."

The result is a software-intense business that needs senior developers, database administrators, web developers and back-end scripting. "We use Java to handle some of our business logic, and we primarily use active server pages," explains Henson. "We need people who show their communication skills, can work with the end-users and develop relationships that transform fuzzy logic into actual requirements."

CoolSavings plans to add 50 percent growth to the IT organization this year. New employees begin as members of a SWAT team. "You'll handle everything from bug fixes to new features that need to go up quickly. You'll develop, maintain and support the site to gain learning about it. There's just no other

Christopher Landry, recruiter for Deloitte Touche. "We need people who are proficient in these basic skills and who can be trained in other technologies that we deliver to our clients, such as Ironworks, SalesLogix and SpaceWorks."

Deloitte Touche works primarily with companies in manufacturing, distribution, public sector, not-for-profit, real estate, financial services and high tech. "Typically you would be working on e-business strategy and development engagements, as well as e-business package implementations," Landry explains. The firm also works with clients to integrate legacy systems with new e-commerce systems, as well as personalization of systems, customer relationship management and EAI applications.



way to learn," says Henson. "Then you get to pick what you want to work on - short or long-term projects, the SWAT team or back-end. You can specialize or move from area to area."

"We're a standard dot-com - the work is fast-paced and challenging," says Henson. "We adapt new technologies readily. Most of all, we have fun. We want people to be able to look forward to coming to work."

## Deloitte Touche Chicago, IL

As e-business shifts into a core position for the Deloitte Touche firm, Java and Java Script capabilities are critical. "The basis for a majority of the e-commerce and e-business development projects we are working with and will be working with are based on Java and JavaScript technologies," says

Landry looks on resumes for a long list of technologies in application development, database development and infrastructure and design. "We look for languages such as Visual Basic, Java, C++ and active server pages," Landry says. "In addition to NT and UNIX, we also look for experience with infrastructure systems ranging from Domino to Cisco to Bay Networks." The firm partners with several system providers, including Siebel, SalesLogix, JD Edwards and Lawson.

"There are several very good reasons to join Deloitte Touche," Landry says. "Our solution practice is growing at 30 to 40 percent annually. Our target market, mid-market growth companies, will afford you the best opportunity to grow quickly and work with cutting-edge technologies. And Deloitte Touche is continually listed in *Fortune* Magazine's professional services sector of '100 Best Places to Work for in America.'"

## Digineer, Inc. Mason, OH

More than half the software developed by Digineer, Inc. is a direct link to patients receiving healthcare. "We are focused on clinical applications and the care side of the operation," explains Jeff Amfahr, vice president/chief technology officer for Digineer.

The company, located just north of Cincinnati, recently completed a fully integrated, online system to run the GI clinic at Mayo Clinic in Rochester, MN. "The clinic sees several hundred patients every day, and the medical histories and images are now available online and as needed instead of by physically retrieving a medical file," explains Amfahr. The majority of projects developed by Digineer depend on Java and Java Beans.

"These are white canvas systems," adds Amfahr. "Right now we are developing a diabetes management system. The projects involve software, but also complex medical issues. The systems have to be perfect." Amfahr seeks people who have led projects or parts of projects, who have worked in teams on development, and who have experience documenting their work.

"We keep people at Digineer because we do custom development," he says. "There's some new project all the time, not just upgrades. Plus, it's emotionally satisfying. What we do helps people and that's nice to know."

## iXL, Inc. San Francisco, CA

iXL is in the business of e-transformation. "We help companies move from where they are today – whether they are bricks and mortar or a brand new startup – into the new economy," explains Steve Gee, vice president of technology for iXL. "While most people think of the new economy as Internet-driven, we think of companies transforming the way they do business by building world-class sites through the fusion of strategy, back-end technology, creative design and marketing."

iXL works with a variety of clients, including Virgin Atlantic, Delta Air Lines, General Electric and several startup dot-coms. iXL did the HTML design and graphic layout through back-end technology integration for Delta Air Lines' web site. Virgin Atlantic called upon the company to develop its entire Internet capability, including online ticket bookings and communicating with frequent flyers.

"We need people with one to three years Java experience, although we do hire some recent college graduates with computer science or engineering degrees," says Gee.

"iXL places a strong emphasis on other competencies – whether you can work on a team for instance. It also helps to have experience with the entire development life cycle so you can appreciate the need to define business requirements, architecture, design, coding and coding standards, reusable components and quality assurance."

At iXL's San Francisco location, turnover of personnel is low for this industry, with no voluntary losses in the past four months. "There are a lot of secrets to keeping talented people," says Gee. "For example, we know that the nature of being an engineer is that you want to keep on learning. Therefore, we leverage our industry-leading technology alliance partner program, allowing you deeper access to the best technologies. We have development labs where you can get on, play with and build many of the new and emerging technologies."

iXL also offers a 4X4 Engineering Fellowship. "This leverages the variety of our projects and the type of company we are," explains Gee. "You get the opportunity to work in four different industries, using four different technologies during your first two years. It's ideal for those who want and need diversity. Afterward, some will choose to specialize and immerse deeply into a technology or industry, while others will want to continue to learn new technologies and industries. Here you have the freedom, encouragement and support to go beyond your perceived limits. We want you to be the best engineer you can possibly be."

## Synapta Palo Alto, CA

Bringing dot-coms to life is Synapta's bread and butter. Since 1994, the company has played a critical role in building the technology behind some of the Internet's most successful startups, including DoDots, zipRealty.com and HomeGain.

"Typically, we're approached by one or two individuals armed with an idea," explains Tiffany Dickey, Synapta's manager of human resources. "Seed-stage entrepreneurs turn to Synapta to develop the core technology that brings Internet startups to life. Synapta stands out because you don't need millions to start working with us. But, you do need a viable business model and a capable management team," she cautions. Engagements at Synapta usually range from \$150,000 to \$300,000.

"zipRealty.com is a prime example of a successful Synapta startup," Dickey states. "The online realty service came to Synapta with a rock-solid business proposition and seed stage funding. zipRealty.com aimed to launch a site that would allow people to buy and sell homes on the Web. We worked

closely with their internal technology team to design and implement the company's winning technology solution in only eight weeks – which led to the first home sale over the Web just six weeks after the launch," says Dickey. "When zipRealty.com was ready to develop their own solution, Synapta helped transition them effectively."

Synapta helps startup clients by providing them with technology strategy, application development and site management services. "Synapta focuses on building the technological foundation for the company, allowing the founders time to find clients, build partnerships, and search for funding," says Dickey. "In addition to building and implementing a proven technology strategy for its seed-stage clients, which helps reduce the risks associated with creating e-businesses, Synapta also serves as a core member of its client's technology team when presenting to potential investors. By doing so, Synapta helps its roster of startups secure the funding necessary to get to market rapidly."

Dickey says Synapta is looking for people to be creative members of teams using advanced technologies such as EJB and Java. "Typically, we hire one out of every five candidates. We spend a lot of time getting to know the people applying to work here because it's important that there's not only a technical fit, but also that this will be a place they will enjoy and stay. Synapta needs employees who thrive in a fast-paced environment, who have stellar Internet software skills, especially senior Java developers and people who have designed eye-catching Web sites – the look and feel as well as the infrastructure."

Project management is also very important, Dickey adds, because "what takes us six to eight weeks may take six months at a more traditional company. At Synapta, our engineers have an opportunity to immerse themselves in new technology projects every six to eight weeks, keeping them stimulated and engaged."

For more job opportunities with JAVA, turn to the pages of IT Careers.

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 850.312.0687 or [janis\\_crowley@itcareers.net](mailto:janis_crowley@itcareers.net).

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## Once Strong, Lucent Now Trails Rivals

Cisco, Nortel dominate healthy network market

BY MEGHAN HOLOHAN

**A**T A TIME when its competitors are racking up impressive gains, onetime networking wonder Lucent Technologies Inc. [NYSE:LU] has suffered management shake-ups, unstable stock prices and lower-than-expected revenue.

Last week, the president of Lucent's optical networks division and the CEO of its service provider networks group both left the company. Murray Hill, N.J.-based Lucent has announced that it won't fill the former position.

Meanwhile, rival Cisco Systems Inc.

[NASDAQ:CSCO] last week reported that net income for its fourth quarter ended July 29 was up 69% from the same quarter a year earlier, and Nortel Networks Corp. [NYSE:NT] has been making deals with companies to provide telecommunications support in foreign markets.

For the past month, Lucent's stock price has been bouncing between \$40 and \$60 per share — far from the \$84 per share it hit in December.

Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass., says he has been expecting some turmoil within Lucent's management ranks.

"Lucent looked promising a couple of years ago, and now it's facing its first financial troubles," he says.

Competitors like San Jose-based Cisco and Brampton, Ontario-based Nortel have pulled ahead of Lucent in market share, and Lucent has failed to mount an effective marketing offensive to keep up, Slaby says.

Lucent's attempts at innovative networking products have not been well received by the market, and the company hasn't been as successful in absorbing new technology from start-up companies as Cisco and Nortel have, says Nikos Theodosopoulos, managing director at UBS Warburg in New York.

"Nortel made a bold move into optical and high-speed optical, and they've timed it perfectly because that has been where we've seen market spending," says David Toung, a senior analyst at Argus Research Corp. in New York.

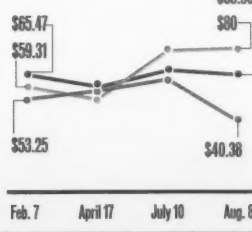
Cisco dominates the high-end corporate market, which is helping it to create inroads to the service provider market, according to Theodosopoulos. ■

## INDUSTRY ALMANAC

## Left Behind

Lucent's stock price has declined this year; competitors Cisco and Nortel have fared better on Wall Street

● CISCO SYSTEMS  
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| DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   |
| SOFTWARE UP 2.89%                                 |   |   |   |   |   |
| ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               |
| ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              |
| AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     |
| ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             |
| ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    |
| AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                |
| BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     |
| BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 |
| BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        |
| CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             |
| CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  |
| CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             |
| CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          |
| CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) |
| CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   |
| CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   |
| EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           |
| HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    |
| HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                |
| ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       |
| INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                |
| IFMA 17.20 4.00 Infomax Software Inc.             | IFMA 17.20 4.00 Infomax Software Inc.             | IFMA 17.20 4.00 Infomax Software Inc.             | IFMA 17.20 4.00 Infomax Software Inc.             | IFMA 17.20 4.00 Infomax Software Inc.             | IFMA 17.20 4.00 Infomax Software Inc.             |
| INTJ 90.00 22.50 Intuit                           | INTJ 90.00 22.50 Intuit                           | INTJ 90.00 22.50 Intuit                           | INTJ 90.00 22.50 Intuit                           | INTJ 90.00 22.50 Intuit                           | INTJ 90.00 22.50 Intuit                           |
| INTY 34.50 15.50 J.D. Edwards Associates          | INTY 34.50 15.50 J.D. Edwards Associates          | INTY 34.50 15.50 J.D. Edwards Associates          | INTY 34.50 15.50 J.D. Edwards Associates          | INTY 34.50 15.50 J.D. Edwards Associates          | INTY 34.50 15.50 J.D. Edwards Associates          |
| INTL 110.87 19.75 J.D. Edwards & Co.              | INTL 110.87 19.75 J.D. Edwards & Co.              | INTL 110.87 19.75 J.D. Edwards & Co.              | INTL 110.87 19.75 J.D. Edwards & Co.              | INTL 110.87 19.75 J.D. Edwards & Co.              | INTL 110.87 19.75 J.D. Edwards & Co.              |
| LOGI 82.50 8.75 Legato Systems Inc. (L)           | LOGI 82.50 8.75 Legato Systems Inc. (L)           | LOGI 82.50 8.75 Legato Systems Inc. (L)           | LOGI 82.50 8.75 Legato Systems Inc. (L)           | LOGI 82.50 8.75 Legato Systems Inc. (L)           | LOGI 82.50 8.75 Legato Systems Inc. (L)           |
| MAC 103.87 27.37 Macromedia Inc.                  | MAC 103.87 27.37 Macromedia Inc.                  | MAC 103.87 27.37 Macromedia Inc.                  | MAC 103.87 27.37 Macromedia Inc.                  | MAC 103.87 27.37 Macromedia Inc.                  | MAC 103.87 27.37 Macromedia Inc.                  |
| MANU 20.25 3.06 Manugistics Group Inc.            | MANU 20.25 3.06 Manugistics Group Inc.            | MANU 20.25 3.06 Manugistics Group Inc.            | MANU 20.25 3.06 Manugistics Group Inc.            | MANU 20.25 3.06 Manugistics Group Inc.            | MANU 20.25 3.06 Manugistics Group Inc.            |
| MAN 21.00 7.75 ManTech International              | MAN 21.00 7.75 ManTech International              | MAN 21.00 7.75 ManTech International              | MAN 21.00 7.75 ManTech International              | MAN 21.00 7.75 ManTech International              | MAN 21.00 7.75 ManTech International              |
| MFT 179.93 60.37 Microsoft Corp.                  | MFT 179.93 60.37 Microsoft Corp.                  | MFT 179.93 60.37 Microsoft Corp.                  | MFT 179.93 60.37 Microsoft Corp.                  | MFT 179.93 60.37 Microsoft Corp.                  | MFT 179.93 60.37 Microsoft Corp.                  |
| NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               |
| NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  |
| NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       |
| ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     |
| PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       |
| PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    |
| PLD 56.37 32.20 Pricer                            | PLD 56.37 32.20 Pricer                            | PLD 56.37 32.20 Pricer                            | PLD 56.37 32.20 Pricer                            | PLD 56.37 32.20 Pricer                            | PLD 56.37 32.20 Pricer                            |
| RAIL 10.75 29.37 Railsoft Software Corp.          | RAIL 10.75 29.37 Railsoft Software Corp.          | RAIL 10.75 29.37 Railsoft Software Corp.          | RAIL 10.75 29.37 Railsoft Software Corp.          | RAIL 10.75 29.37 Railsoft Software Corp.          | RAIL 10.75 29.37 Railsoft Software Corp.          |
| RHAT 103.31 7.00 Red Hat Inc.                     | RHAT 103.31 7.00 Red Hat Inc.                     | RHAT 103.31 7.00 Red Hat Inc.                     | RHAT 103.31 7.00 Red Hat Inc.                     | RHAT 103.31 7.00 Red Hat Inc.                     | RHAT 103.31 7.00 Red Hat Inc.                     |
| GFT 98.02 7.00 Quest Software                     | GFT 98.02 7.00 Quest Software                     | GFT 98.02 7.00 Quest Software                     | GFT 98.02 7.00 Quest Software                     | GFT 98.02 7.00 Quest Software                     | GFT 98.02 7.00 Quest Software                     |
| SCAP 165.87 29.37 SAP AG                          | SCAP 165.87 29.37 SAP AG                          | SCAP 165.87 29.37 SAP AG                          | SCAP 165.87 29.37 SAP AG                          | SCAP 165.87 29.37 SAP AG                          | SCAP 165.87 29.37 SAP AG                          |
| SCUR 29.62 2.50 Secure Computing Corp.            | SCUR 29.62 2.50 Secure Computing Corp.            | SCUR 29.62 2.50 Secure Computing Corp.            | SCUR 29.62 2.50 Secure Computing Corp.            | SCUR 29.62 2.50 Secure Computing Corp.            | SCUR 29.62 2.50 Secure Computing Corp.            |
| SDSC 19.00 8.81 Structural Dynamics Research      | SDSC 19.00 8.81 Structural Dynamics Research      | SDSC 19.00 8.81 Structural Dynamics Research      | SDSC 19.00 8.81 Structural Dynamics Research      | SDSC 19.00 8.81 Structural Dynamics Research      | SDSC 19.00 8.81 Structural Dynamics Research      |
| SPSC 11.00 9.92 Spacenet Inc.                     | SPSC 11.00 9.92 Spacenet Inc.                     | SPSC 11.00 9.92 Spacenet Inc.                     | SPSC 11.00 9.92 Spacenet Inc.                     | SPSC 11.00 9.92 Spacenet Inc.                     | SPSC 11.00 9.92 Spacenet Inc.                     |
| SVWC 81.62 25.37 Symantec Corp.                   | SVWC 81.62 25.37 Symantec Corp.                   | SVWC 81.62 25.37 Symantec Corp.                   | SVWC 81.62 25.37 Symantec Corp.                   | SVWC 81.62 25.37 Symantec Corp.                   | SVWC 81.62 25.37 Symantec Corp.                   |
| SYSC 15.62 25.93 Syntex Inc.                      | SYSC 15.62 25.93 Syntex Inc.                      | SYSC 15.62 25.93 Syntex Inc.                      | SYSC 15.62 25.93 Syntex Inc.                      | SYSC 15.62 25.93 Syntex Inc.                      | SYSC 15.62 25.93 Syntex Inc.                      |
| SYST 19.00 19.00 Systems & Computer Technology    | SYST 19.00 19.00 Systems & Computer Technology    | SYST 19.00 19.00 Systems & Computer Technology    | SYST 19.00 19.00 Systems & Computer Technology    | SYST 19.00 19.00 Systems & Computer Technology    | SYST 19.00 19.00 Systems & Computer Technology    |
| TIBA 147.00 6.56 Tibco Software Inc.              | TIBA 147.00 6.56 Tibco Software Inc.              | TIBA 147.00 6.56 Tibco Software Inc.              | TIBA 147.00 6.56 Tibco Software Inc.              | TIBA 147.00 6.56 Tibco Software Inc.              | TIBA 147.00 6.56 Tibco Software Inc.              |
| TAI 48.02 13.37 Transaction Systems Architects    | TAI 48.02 13.37 Transaction Systems Architects    | TAI 48.02 13.37 Transaction Systems Architects    | TAI 48.02 13.37 Transaction Systems Architects    | TAI 48.02 13.37 Transaction Systems Architects    | TAI 48.02 13.37 Transaction Systems Architects    |
| TECH 103.87 13.37 Wind River Systems Inc.         | TECH 103.87 13.37 Wind River Systems Inc.         | TECH 103.87 13.37 Wind River Systems Inc.         | TECH 103.87 13.37 Wind River Systems Inc.         | TECH 103.87 13.37 Wind River Systems Inc.         | TECH 103.87 13.37 Wind River Systems Inc.         |
| TELECOMMUNICATIONS CARRIERS OFF -4.0%             |   |   |   |   |   |
| AT 99.87 55.87 AT&T Corp.                         | AT 99.87 55.87 AT&T Corp.                         | AT 99.87 55.87 AT&T Corp.                         | AT 99.87 55.87 AT&T Corp.                         | AT 99.87 55.87 AT&T Corp.                         | AT 99.87 55.87 AT&T Corp.                         |
| ANOR 62.00 37.18 Anadigm Corp.                    | ANOR 62.00 37.18 Anadigm Corp.                    | ANOR 62.00 37.18 Anadigm Corp.                    | ANOR 62.00 37.18 Anadigm Corp.                    | ANOR 62.00 37.18 Anadigm Corp.                    | ANOR 62.00 37.18 Anadigm Corp.                    |
| AT 51.00 29.62 AT&T (L)                           | AT 51.00 29.62 AT&T (L)                           | AT 51.00 29.62 AT&T (L)                           | AT 51.00 29.62 AT&T (L)                           | AT 51.00 29.62 AT&T (L)                           | AT 51.00 29.62 AT&T (L)                           |
| BCE 127.50 21.06 BCE Inc.                         | BCE 127.50 21.06 BCE Inc.                         | BCE 127.50 21.06 BCE Inc.                         | BCE 127.50 21.06 BCE Inc.                         | BCE 127.50 21.06 BCE Inc.                         | BCE 127.50 21.06 BCE Inc.                         |
| BT 103.87 13.37 British Telecom                   | BT 103.87 13.37 British Telecom                   | BT 103.87 13.37 British Telecom                   | BT 103.87 13.37 British Telecom                   | BT 103.87 13.37 British Telecom                   | BT 103.87 13.37 British Telecom                   |
| BRW 41.00 16.31 Brown Boveri Ltd.                 | BRW 41.00 16.31 Brown Boveri Ltd.                 | BRW 41.00 16.31 Brown Boveri Ltd.                 | BRW 41.00 16.31 Brown Boveri Ltd.                 | BRW 41.00 16.31 Brown Boveri Ltd.                 | BRW 41.00 16.31 Brown Boveri Ltd.                 |
| CMSC 57.68 27.87 Comcast                          | CMSC 57.68 27.87 Comcast                          | CMSC 57.68 27.87 Comcast                          | CMSC 57.68 27.87 Comcast                          | CMSC 57.68 27.87 Comcast                          | CMSC 57.68 27.87 Comcast                          |
| COM 42.00 16.25 CompuLink Corp.                   | COM 42.00 16.25 CompuLink Corp.                   | COM 42.00 16.25 CompuLink Corp.                   | COM 42.00 16.25 CompuLink Corp.                   | COM 42.00 16.25 CompuLink Corp.                   | COM 42.00 16.25 CompuLink Corp.                   |
| CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             |
| CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   |
| QCOM 200.00 29.87 Qualcomm Inc.                   | QCOM 200.00 29.87 Qualcomm Inc.                   | QCOM 200.00 29.87 Qualcomm Inc.                   | QCOM 200.00 29.87 Qualcomm Inc.                   | QCOM 200.00 29.87 Qualcomm Inc.                   | QCOM 200.00 29.87 Qualcomm Inc.                   |
| NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               | NETA 21.18 55.87 Network Associates               |
| NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  | NETS 62.00 16.25 Network General                  |
| NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       | NOV 44.56 17.00 Novell Inc.                       |
| ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     | ORCL 60.00 17.34 Oracle Corp.                     |
| PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       | PMSC 39.03 1.27 Parametric Technology Corp.       |
| PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    | PIFI 77.75 12.00 Perforce Inc.                    |   |   |   |

| 52 WEEK NAME                                      | 52 WEEK NAME                                      | 52 WEEK NAME                                      | 52 WEEK NAME                                      | 52 WEEK NAME                                      | 52 WEEK NAME                                      |
|---|---|---|---|---|---|
| DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   | DATE 7 PM   |
| SOFTWARE UP 2.89%                                 |   |   |   |   |   |
| ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               | ADSK 149.12 11.00 Autodesk Software               |
| ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              | ADBE 143.31 41.25 Adobe Systems Inc.              |
| AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     | AREA 163.34 16.56 Arriba Inc.                     |
| ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             | ASPN 56.57 9.12 Aspen Technology Inc.             |
| ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    | ADSK 58.06 17.00 Autodesk Inc.                    |
| AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                | AVD 15.56 8.75 Autodesk Technology                |
| BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     | BEAM 16.26 1.12 Beam Co. N.Y.                     |
| BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 | BMC 56.62 16.12 BMC Software Inc.                 |
| BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        | BURL 15.57 19.50 Burlington Resources S.A.        |
| CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             | CEN 14.80 3.18 Cadence Design Systems             |
| CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  | CHMT 147.50 14.40 Checkpoint Software Tech. Ltd.  |
| CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             | CTSD 122.31 14.20 Citrix Systems Inc.             |
| CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          | CDON 46.50 5.68 Cognitix                          |
| CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) | CA 79.43 23.68 Computer Associates Int'l Inc. (L) |
| CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   | CPWR 40.00 7.50 CompuLink Corp.                   |
| CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   | CTSH 146.03 32.75 Computer Technology Resources   |
| EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           | EFH 69.31 21.06 Electronics For Imaging           |
| HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    | HNCS 130.00 29.87 Hcs Software                    |
| HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                | HYST 49.00 15.12 Hyperion Software                |
| ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       | ITC 49.02 10.37 ITC Systems                       |
| INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                | INF 110.87 16.06 Informatica Corp.                |
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# Federal Ruling May Impact Temp Hiring

Decision could affect IT staffing strategies

BY JULEKHA DASH

**A**FEDERAL LABOR decision due out later this month could force companies that employ temporary information technology workers to change their staffing strategies.

The U.S. National Labor Relations Board (NLRB), a federal agency that administers relations between employers and unions, has been considering the question for four years without result, but it might make a decision soon to avoid confusion following turnover of some board members later this month, observers said.

If a bill introduced several weeks ago passes, employers wouldn't be allowed to deny

benefits to workers simply because they are temps. Observers said the bill is unlikely to go through this year because Congress is currently in recess, and once lawmakers return to Capitol Hill, they will have only a few weeks to deal with routine matters before the presidential election in the fall.

As employers' use of temps comes under scrutiny, labor experts said employers may have less flexibility in their staffing strategies and find fewer economic benefits from hiring temporary workers.

"It's highly likely that the NLRB will overturn" the so-called Greenhoo Rule, which bans temps from joining unions without obtaining permission from the staffing agency and

the company that hired them, according to John Raudabaugh, a Chicago-based labor attorney and former NLRB member. If temps join union ranks and demand higher wages, employers may turn over such workers more quickly, class others as semipermanent or use other tactics to avoid making temps permanent, he said.

According to the American Staffing Association (ASA) in Alexandria, Va., technology positions accounted for about 11% of the payroll for all temporary positions in 1998, though such workers represent little more than 2% of the workforce.

## Opportunity for Unions

Marcus Courtney, co-founder of the Seattle-based Washington Alliance of Technology Workers (WashTech), said if the NLRB overturns the

Greenhoo decision, temps could provide unions an "opportunity to organize in a way they never had before," particularly in cases where employers use temporary and full-time union employees to perform the same work. WashTech organized on behalf of "permatemps" at Microsoft Corp., who demanded stock options from the company.

Edward Lenz, general counsel at the ASA, said that since high-tech workers are typically better compensated than other types of temps, they have fewer incentives to join unions. But Courtney said he believes unions would be able to respond more effectively during high-profile labor disputes.

Nancy Andersen, a Beverly Hills, Calif.-based Web developer who is working on a six-month project at Countrywide Securities Corp., said she might be interested in joining a union if it addressed unemployment compensation. Temporary workers can't collect unemployment and often have no recourse if they are suddenly terminated, she said.

## Temp Time Line:

### August 2000

National Labor Relations Board will decide whether temporary employees can join unions without obtaining permission from the staffing agency and company where they are working.

### July 2000

Sen. Edward M. Kennedy (D-Mass.) and Rep. Robert E. Andrews (D-New Jersey) introduce federal legislation that would extend the rights of permatemps.

### January 2000

The U.S. Supreme Court rejects Microsoft's appeal of a lower court's ruling that ordered the company to grant stock options to employees working at least five months in a twelve-month period.

Raudabaugh said employers that have unionized groups need to be cautious about whether they want to expand the size of their union with temp workers doing the same work as full-time employees. ■

Continued from page 1

## Verizon

bargaining. Unions need to redefine themselves in order to survive among a mobile workforce with different attitudes, he said.

For example, they need to find a way to appeal to the mind-set that information technology workers typically have. Web designers and systems administrators are libertarians at heart, according to Harris Miller, president of the Information Technology Association of America, an Arlington, Va.-based trade association for the U.S. IT industry.

"They don't want guaranteed job protection," he said. "They want flexibility to leave for more money ... and to make out like a bandit when the company goes public. They don't want to be paid based on seniority; they want to be paid more than the person sitting the next desk over if they're

putting in more hours."

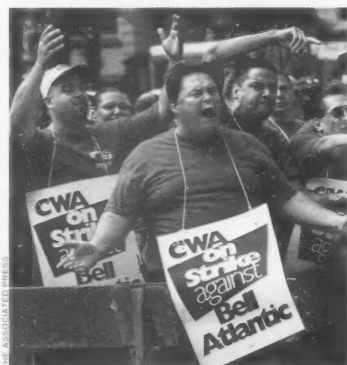
And in today's hot economy and tight job market, it seems that they're getting what they ask for.

"They have more clout, freedom and perks," said Kazin Isfahani, an analyst at Giga Information Group Inc. in Stamford, Conn. "There isn't a need for a union."

Not so, said CWA spokesman Steve Early.

"The wonderful jobs in the New Economy are lacking several ingredients," he said. High-tech workers need to have a say in their working conditions, grievance procedures and ways to negotiate with management in rapidly changing environments, he said.

But Jim Hossack, an analyst at AutoPacific Inc. in Tustin, Calif., said he doubts unions will make much headway in the high-tech industry due to



ORGANIZED LABOR hopes to renew itself by recruiting high-tech members, like these Verizon workers

the entrenched differences in the operations of traditional and high-tech industries.

"If demand for a product goes down, high-tech companies just stop making it," said Hossack. "But union contracts [with auto manufacturers] can demand 95% of worker's take-home pay even if

demand goes down."

According to AFL-CIO spokeswoman Lane Windham, the Verizon strike is part of a general effort on the part of unions to adapt to the New Economy.

"Just as there are lots of start-up companies, there are lots of start-up unions," she said.

These unions often take nontraditional forms. For example, AFL-CIO-affiliated Working Partnership is a kind of nonprofit temp agency formed by Silicon Valley's

high-tech workers. If the Verizon union members succeed in unionizing the company's broadband and wireless divisions, it could inspire workers in other companies, according to Daniel Cornfield, chairman of sociology at Vanderbilt University in Nashville.

Old Economy unions such as the United Auto Workers (UAW) are moving into non-traditional union sectors: Last year, the 3,000-member Graphics Artists Guild joined up. The union also represents some 48,000 state employees and service, technical and graduate student employees at more than 20 colleges and universities, as well as the 5,000-member National Writers Union. Analysts say UAW now has its sights set on high-tech workers within its automotive stronghold.

"The automakers are moving away from just selling metal and want to get incremental revenue from technology-based products, like telematics [in-vehicle communications]," said Thilo Koslowski, an automotive analyst at Gartner Group Inc. in Stamford, Conn. "The unions recognize this, and they want membership in high-tech." ■

Reporter Lee Copeland contributed to this report.



FRANK HAYES/FRANKLY SPEAKING

## Web vigilantes

**M**AYBE THE WILD, WILD WEB hasn't become so tame after all. Last week, a federal judge refused to force an antispam group called MAPS to lift its blockade against mass e-mail from Harris Interactive (yes, the people who do the Harris Poll). Let's be clear here: Mail Abuse Prevention System (MAPS) is a vigilante group. It has no government mandate to block spam. Those who subscribe to MAPS' Realtime Blackhole List of spam sources whose mail won't go through — including Microsoft's Hotmail and America Online

— do so voluntarily. And accused spammers like Harris believe MAPS acts as judge, jury and executioner — just like a vigilance committee in the Old West.

And let's be clear about something else: Though Harris may think MAPS is a gang of outlaws, U.S. District Court Judge David G. Larimer doesn't agree. Larimer turned down Harris' request for a restraining order to stop MAPS from "blackholing" Harris' e-mail until the company's lawsuit against MAPS comes to trial. The judge could have issued that order if he thought Harris was right.

Yes, vigilantes are out there. These aren't anonymous crackers vandalizing Web sites they don't like. But they're also not government bureaucrats enforcing the law. They're something in between the two.

And if you tangle with them, don't mistake their lack of government authority for a shortage of power.

You're a legitimate organization? So are they. You're just trying to do business? They're just exercising their rights to opt out. You've got rights? So do they — and they'll take direct action to defend them.

MAPS, for example, maintains lists of Internet addresses that spam comes from. E-mail services and Internet service providers use those lists to block spam. If your company's IP address is on the list, its e-mail won't arrive at those mailboxes.

In an e-business world, that's power.

And MAPS isn't alone. Antismut and security software vendors can add your name to their lists, too. Sometimes it isn't even your name, but a word on your Web site or the technology you use. No matter — if you're blocked, you're blocked.

Can they do that? The legal answer to that question will come in a Rochester, N.Y., courtroom in the coming months. The practical answer is yes; they can and do. No one forces their subscribers to participate. And those subscribers can bail out at any time if they decide they don't want spam or Web sites or other Internet technologies blocked. They've joined the vigilance committee, too.

What if you do run afoul of the vigilantes?

These aren't lynch mobs. The first step is to talk with them. Maybe someone's violating your e-mail policy. Maybe you're using a technology they view as a security or privacy problem. Maybe there's a work-around.

Or maybe they've already talked to someone at your company who didn't take the matter seriously. Yes, take it seriously. This isn't simply a nuisance, and it won't go away. Kick it upstairs if necessary — and certainly before you start snarling at them about lawsuits. That's a decision for IT to make — and it's one you really don't want to be making anyway.

Someday, we'll all know a lot more about what's legal, usual and appropriate in e-business. A few more generations of laws will be passed, and a few more generations of lawsuits will settle most of the questions.

But for now, there are vigilantes, and they'll enforce their rights themselves — not waiting

for judges, politicians and the other trappings of civilization. Because the Internet territory really is still a frontier.

And the Web is still pretty wild after all. ■

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is [frank\\_hayes@computerworld.com](mailto:frank_hayes@computerworld.com).

*What if  
you do  
run afoul  
of the  
vigilantes?*



## SHARK TANK

**NEW IT DIRECTOR** bans homegrown software development to cut maintenance costs. But there's no budget for off-the-shelf software either. So when an exec in Finance wants changes to some homegrown weekly reports, the IT director tells a programmer pilot fish to make the changes, "but don't write any software. Get it done some other way."

**FINANCIAL INSTITUTION** hires a PC consultant pilot fish to implement enterprise backup software. If you can't handle this, the MIS veep hints, you better start looking for work elsewhere. The fish scopes out the job and discovers it's impossible — the software the company selected is incompatible with the company's frame-relay network. He files a report explaining the problem. The boss's response: "Don't be so negative."

**NETWORK ADMIN PILOT** FISH gets tired of hearing his wife grumble about the custom health care software she uses at work: error messages, crashes, the works. He suggests she do a

little networking of her own — get her boss to call the IT department and use his inside connection to get help fast. She does. And that fast helpful answer? "Don't shut the thing down, and you won't keep getting the error messages as you boot up."

**GLOBAL ERP PROJECT MANAGER** gathers the troops for the project kickoff speech. He's got three years to roll out the package or he's fired, this insider pilot fish reports. And if that happens, he warns, there will be a lot of people fired ahead of him. "Nothing like a rallying cry for the troops," says the fish.

An architect trying to impress a client recommends nothing but small monitors for a new building's computers. "On a larger screen, the mouse cursor has further to go, and that takes more time," he says. Yeeeah. Send your large, easy-to-read true tales of IT to [sharky@computerworld.com](mailto:sharky@computerworld.com). You get a sharp Shark shirt if your story sees print — or if it turns up in the daily feed at [computerworld.com/sharky](http://computerworld.com/sharky).

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